CLASS I APPLICATION REVIEW

For:

SIERRA PACIFIC RESOURCES COMPANY
ELY ENERGY CENTER

Near Ely, Nevada

CLASS I OPERATING PERMIT TO CONSTRUCT

AP4911-2241
FIN #: A0765
Aircase #: 07AP0267

BY

STATE OF NEVADA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR POLLUTION CONTROL

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1.0 INTRODUCTION

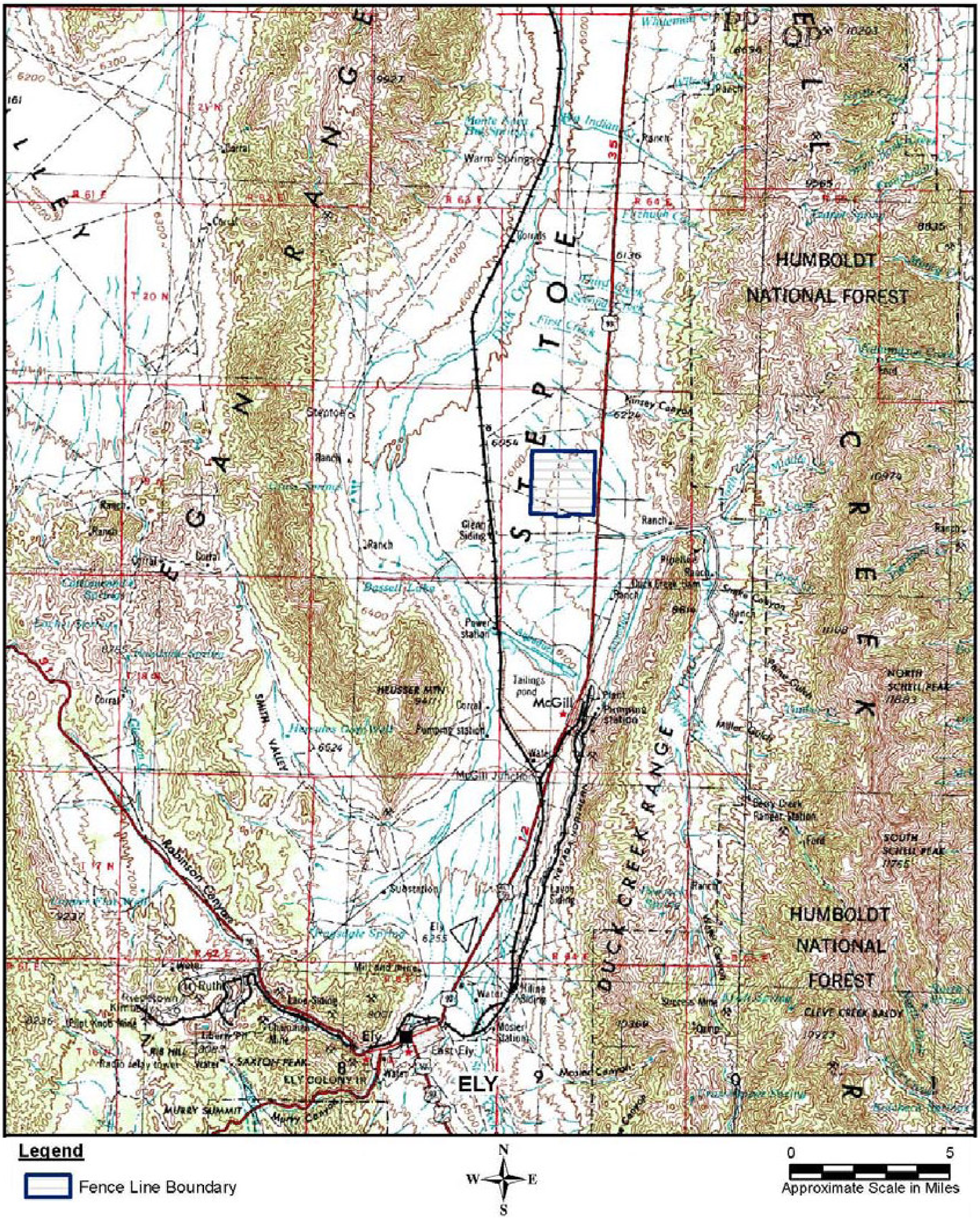
Sierra Pacific Resources (SPR) submitted a Prevention of Significant Deterioration (PSD) Class I Operating Permit to Construct Application for the Ely Energy Center (EEC) to the Nevada Division of Environmental Protection - Bureau of Air Pollution Control (BAPC) on February 7, 2007. Sierra is proposing to construct and operate a new, base-load coal-fired power generation facility, near Ely, Nevada, in White Pine County. The proposed facility will consist of a two-unit, pulverized coal-fired (PC) plant. The plant will use an ultra supercritical cycle and be designed to fire western sub-bituminous coal. Each unit will be rated at 750 megawatts (MW) nominal generating capacity. The facility will consist of:

- Two 750-MW PC boilers (nominal)
- A coal delivery system
- A coal unloading system
- A dead coal storage system
- A live coal storage, crushing, and conveying system
- A coal reclamation system
- Coal bunkers for storage of coal prior to firing
- Lime and soda ash storage silos
- Fly ash storage silos
- Fly ash loading system
- Bottom ash storage silos
- Multi-cell mechanical draft cooling towers
- Distillate oil storage tank for locomotive refueling
- Distillate oil storage tank for boiler ignition fuel, auxiliary boiler fuel, diesel engine generator, and diesel fire water pump fuel
- Ammonia storage tank system
- Powdered activated carbon storage silo
- Gypsum stockout pile
- Magnesium Hydroxide silo
- Limestone storage pile
- Various engine driven auxiliary pumps and generators

The SPR plant and associated features will be located in White Pine County on approximately 2,599 acres (See map below). The SPR plant site is in the center of the Steptoe Valley about 30 miles north of Ely and approximately 6 miles east of the base of the Egan Range on the west side of Highway 93. The SPR plant will be located primarily in Sections 16, 17, 20 and 21 of Township 19 North, Range 64 East at about the following Universal Transverse Mercator (UTM) coordinates: 690,108 meters east and 4,374,813 meters north (Zone 11, North American Datum [NAD] 83). The Standard Industrial Classification (SIC) number for the facility is 4911 (Electric Services), since the primary product is electric power for sale.

Map of Site Area

Topographic Map of Site



2.0 DESCRIPTION OF PROCESS

As was described above, the proposed EEC will consist of a two-unit, pulverized coal-fired (PC) plant. The EEC will use a supercritical cycle and be designed to fire western sub-bituminous coal. Each unit will be rated at 750 megawatts (MW) nominal generating capacity. Ancillary plant equipment will include fuel and waste preparation and handling equipment; fuel and waste loading/unloading, transfer, and storage facilities; a distillate oil-fired auxiliary boiler; fire protection equipment; and auxiliary power facilities (See process flow diagram below). All control equipment has been selected from a best available control technology (BACT) analysis. The EEC will be equipped with a continuous emissions monitoring system (CEMS) that will monitor and record pollutants as required under federal and state regulations.

2.1 ELY ENERGY CENTER POWER GENERATION UNITS

The following sections discuss the design, startup, operation, emissions monitoring, and controls for the EEC power generation units, which include PC Boilers 1 and 2.

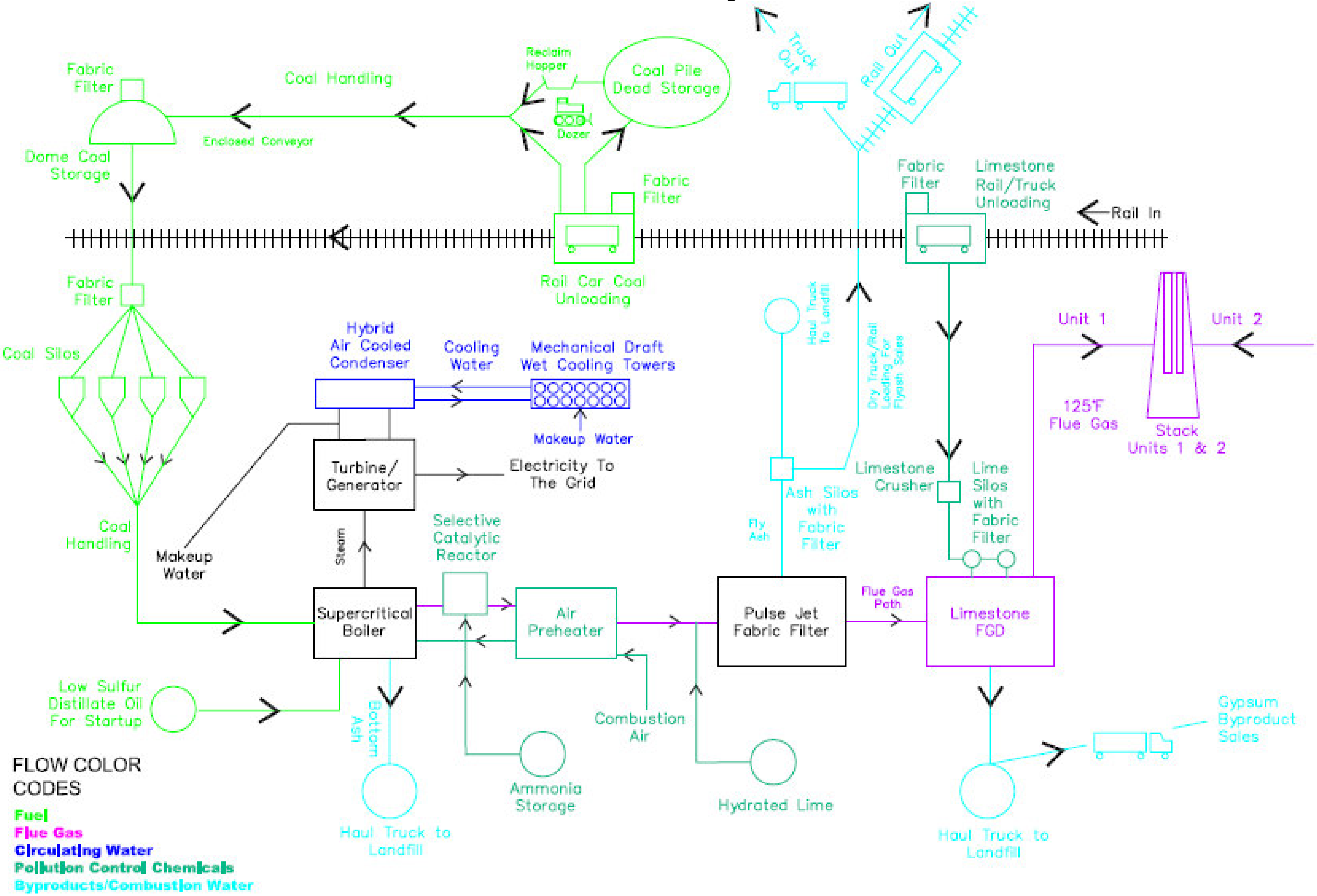
2.1.1 BOILER DESIGN

PC Boilers 1 and 2 will be PC supercritical dry-bottom boilers. The units will use fuel oil for ignition during startup, shutdown and flame stabilization when coal pulverizers are placed into and out of service. The igniters will combust low-sulfur distillate fuel oil containing less than or equal to 0.0015 percent sulfur. Flame stabilization will occur when a pulverizer is placed into service and when removed from service. Exhaust gases will exit to the atmosphere through a single concrete stack with an individual flue for each unit.

2.1.2 BOILER STARTUP

Boiler startup will begin with the introduction and combustion of ultra low-sulfur No. 2 distillate fuel oil that has a sulfur content of less than or equal to 0.0015 percent. Procedures for minimizing emissions during startup are based on the manufacturer’s design. Emissions from startup on fuel oil will be reduced through the use of atomizers designed to combust the fuel uniformly. Igniters are not intended as a heat source for sustained combustion. Igniters will be used during startup to gradually warm the boiler and during shutdown to gradually cool the boiler to reduce stress on boiler components during startup. Oil igniters will also be used to stabilize the flame when coal pulverizers are placed into service and when removed from service. All control systems will be in operation upon the introduction of coal.

Process Flow Diagram



2.0 DESCRIPTION OF PROCESS

2.1.3 BOILER OPERATION

Each boiler is designed to operate efficiently at maximum capacity in a continuous duty cycle up to 8,760 hours per year (hr/yr). The supporting documentation is therefore based on this capacity. Each unit will operate by combusting pulverized coal, and the units are not designed nor is it economically feasible to operate the units on No. 2 fuel oil. During operation, No. 2 fuel oil may be introduced through the igniters to stabilize the flame. As the load increases or decreases, the pulverizers will introduce raw pulverized coal into the boiler, which can result in unstable or dangerous combustion conditions. Unstable combustion conditions can result in higher emissions if igniters are not introduced to stabilize combustion as the pulverizers are put in service. Additionally, without the igniters, unstable conditions could cause uncombusted coal to ignite violently, causing an explosion within the boiler and creating unsafe conditions for workers at the EEC and in the surrounding area.

2.1.4 EMISSIONS MONITORING

The boiler stack will employ CEMS equipment in each flue to track air pollutants in virtually real-time. The constituents tracked will include SO_2, NOx, carbon dioxide (CO_2), a diluent, CO, mercury, fuel and flue gas flow and heat input to the boiler. Opacity monitors will be located in the baghouse outlet ducts to avoid optical interference from wet stack conditions. A CEMS to track SO2 and the diluent will also be installed at the flue gas desulfurization (FGD) inlet. A data acquisition system will compile, process, and store data for the parameters identified above for the averaging periods specified in the operating permit to construct. The CEMS data will be processed in accordance with Title 40 of the *Code of Federal Regulations* (CFR), Parts 60 and 75, to verify compliance with applicable standards, monitor control equipment operation performance, and track SO2 allowances.

Fuel sulfur content laboratory analysis will be provided by the supplier with each delivery to verify that only distillate fuel oil with a sulfur content of 0.0015 percent or less is burned during startup or flame stabilization.

A compliance assurance monitoring (CAM) plan will be developed and submitted to the NDEP Bureau of Air Pollution Control prior to commencement of commercial operation of the EEC to verify that the control equipment subject to CAM requirements is operating within specified limits. The CAM plan will specify monitoring procedures that must be followed to ensure that all the control equipment is operating within design parameters.

After the initial CEMS certification, annual relative accuracy testing audits (RATA) will be conducted in accordance with 40 CFR Parts 60 and 75 to verify that the CEMS are meeting the applicable precision and accuracy requirements.

2.0 DESCRIPTION OF PROCESS

2.1.5 CONTROLS

The PC Boilers 1 and 2 control systems will include coal blending capability; multistage combustion to control CO, VOCs, and NOX; selective catalytic reduction (SCR) to control NOX; a fabric filter system to control particulates and non-volatile metals; and a wet FGD to control SO2 and semi-volatile metals. Acid gases will be controlled by the FGD system and a fabric filter system.

2.2 ELY ENERGY CENTER BALANCE OF PLANT EMISSION SOURCES

This section discusses the design, operation, and control of the EEC's primary fuel handling system, ash handling system, cooling system, auxiliary boiler system, and ancillary equipment.

2.2.1 PRIMARY FUEL HANDLING SYSTEM

Primary Fuel Handling System Design

The EEC will use coal as fuel. The coal will be delivered by rail in rotary dump cars to an unloading shed, where the fuel will be transferred for storage or use. Dust generated during this activity will be controlled by a fabric filter dust collection system that will remove particulates inside the shed. Conveyors will transfer the coal from the unloading shed to a transfer tower. From this point, coal will be transferred to a storage pile by a retractable chute, transported to dead storage, or transported to the two coal domes. Within each dome, coal can be placed directly onto the conveyor belt and transported to the boiler units. Coal unloaded to the storage pile will be leveled and compacted for later use. Coal in the dome storage or dead coal pile can be reclaimed through a reclaim hopper located directly under these piles and conveyed to the boiler silos through a crusher on covered conveyors. Vibrating feeders located under the reclaim hopper will load fuel onto a conveyor. Dust generated from this operation as well as from all the transfer points and storage bins will be controlled by covered conveyors and a fabric filter dust collection system. The two diagrams below illustrate the coal unloading, storage, reclaim, and transfer.

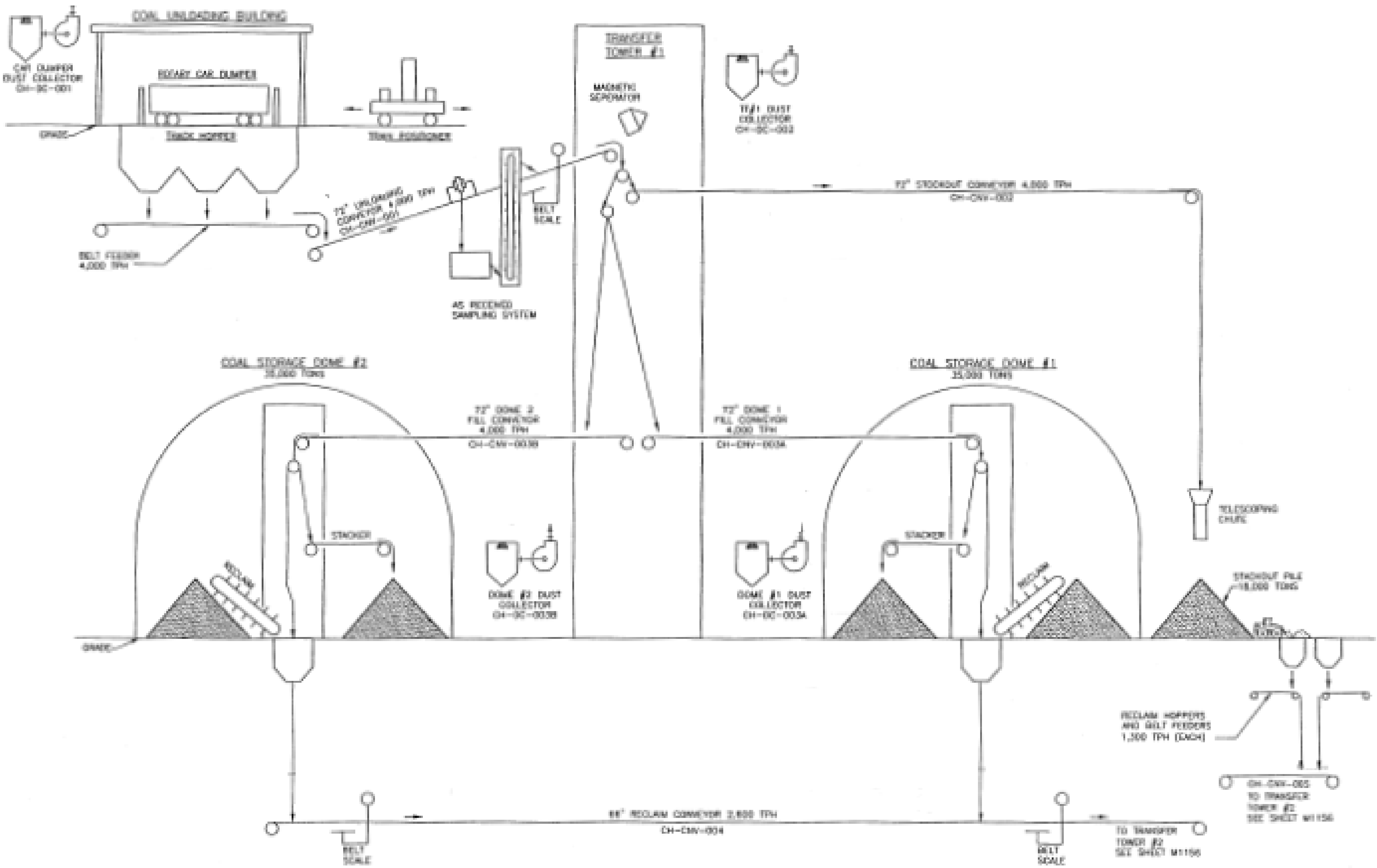
Primary Fuel Handling System Operation

This system is designed for batch operation and may operate any time of the day and during any day of the year (depending on fuel delivery and unit operating schedule).

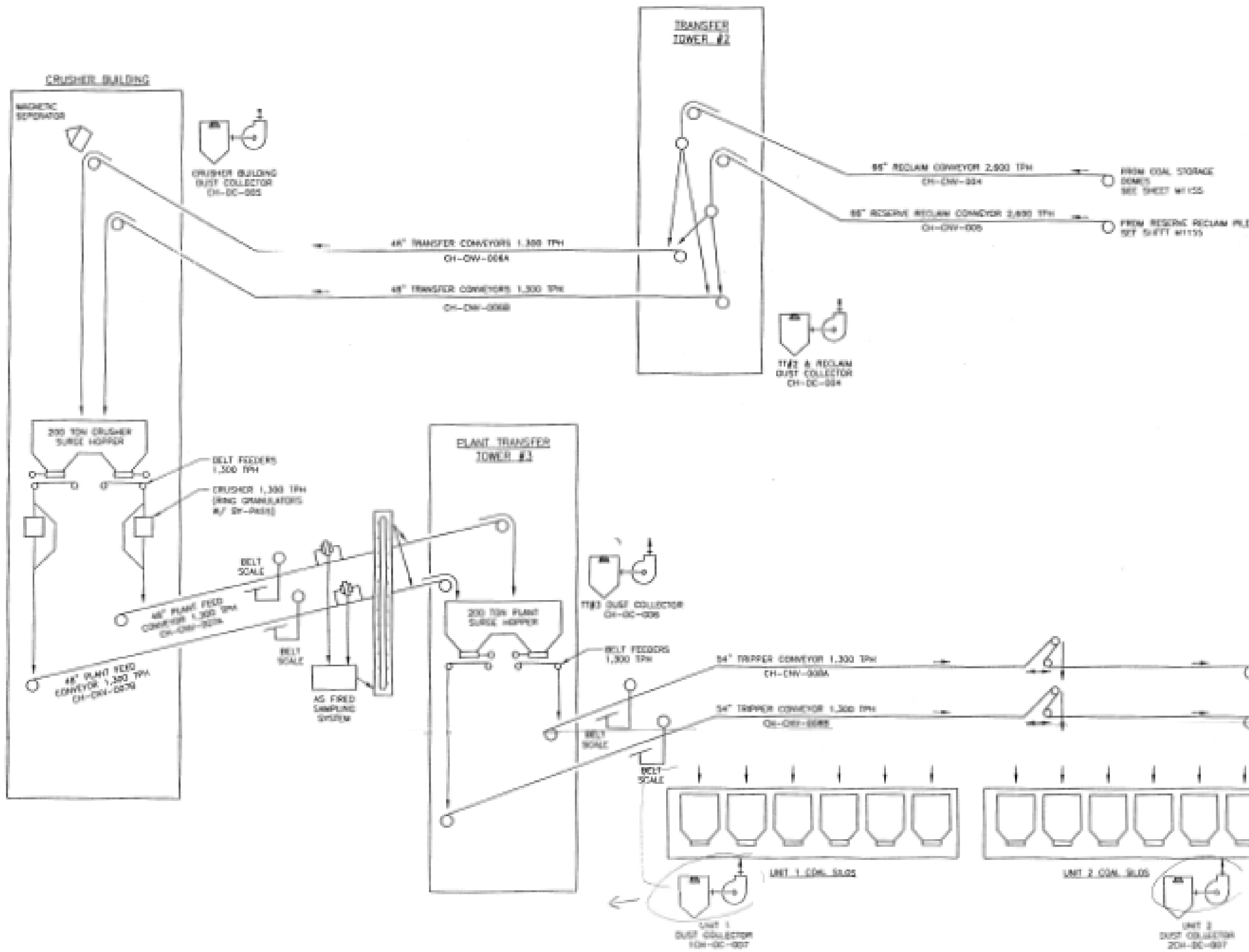
Primary Fuel Handling System Controls

Control systems for fuel handling will include a hood system with covered conveyors and fabric filter dust collectors. Hoods and fabric filter dust collectors will be located at each transfer point to control any particulate emissions during transport of the fuel

Coal Handling: Unloading and Storage



Coal Handling: Reclaim and Transfer



2.0 DESCRIPTION OF PROCESS

2.2.2 ASH HANDLING SYSTEM

Ash Handling System Design

Two separate ash-handling systems are associated with each unit for removal of bottom ash and fly ash produced from coal combustion (See diagrams below). The bottom ash system is a dry system that will convey ash from the hoppers to ash storage silos by a closed conveyor system. Solids will then be removed from the bottom ash silos and transported to an on-site landfill disposal area. The fly ash system is a dry system that will originate at the hoppers below the economizer hopper and the fabric filter dust collectors. Fly ash will be conveyed to an ash storage silo by a closed pneumatic system. Fly ash will be removed from the fly ash silos for off site sales or transported to an on-site landfill for disposal.

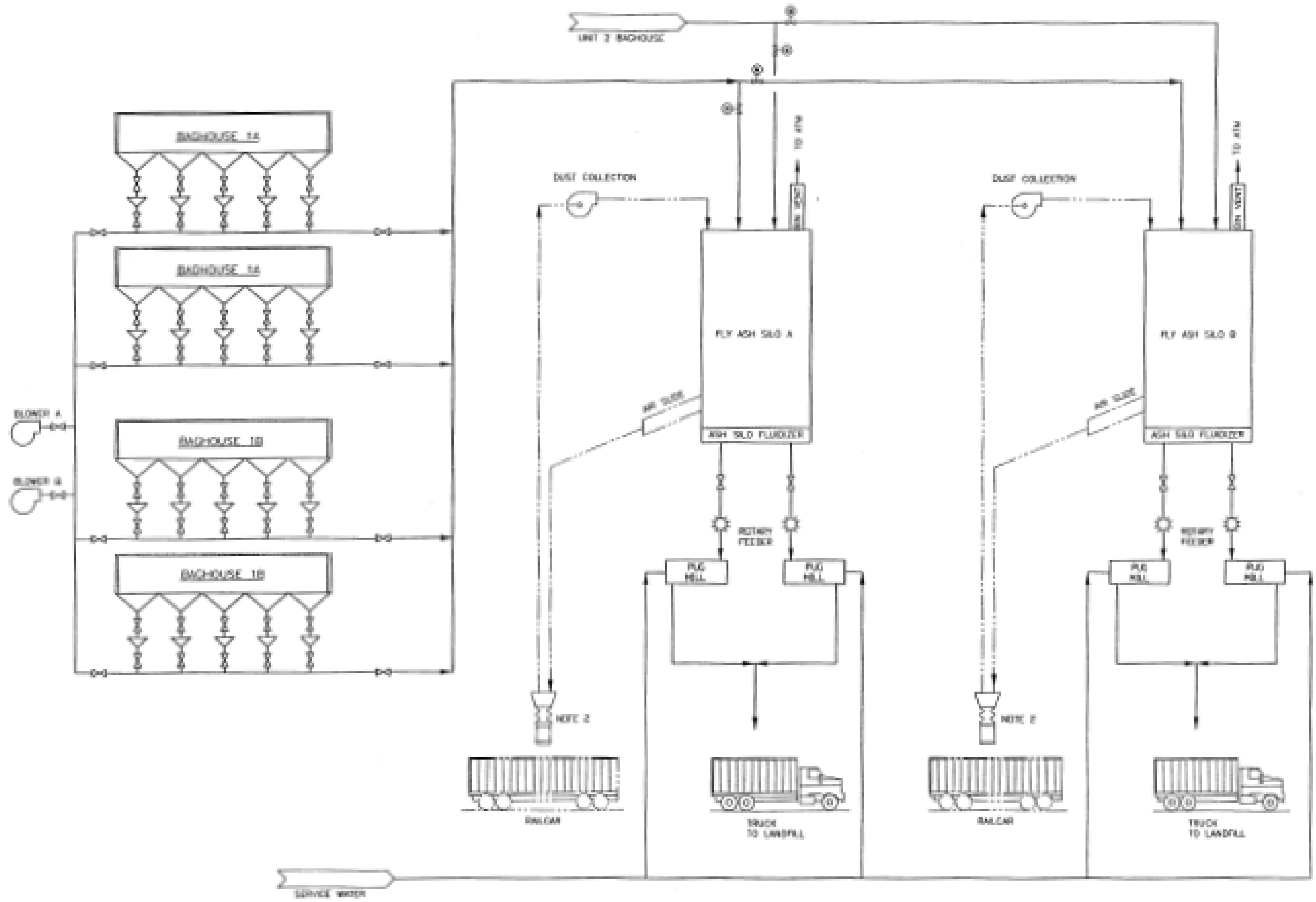
Ash Handling System Operation

Both units will operate efficiently at maximum capacity in a continuous duty cycle up to 8,760 hr/yr.

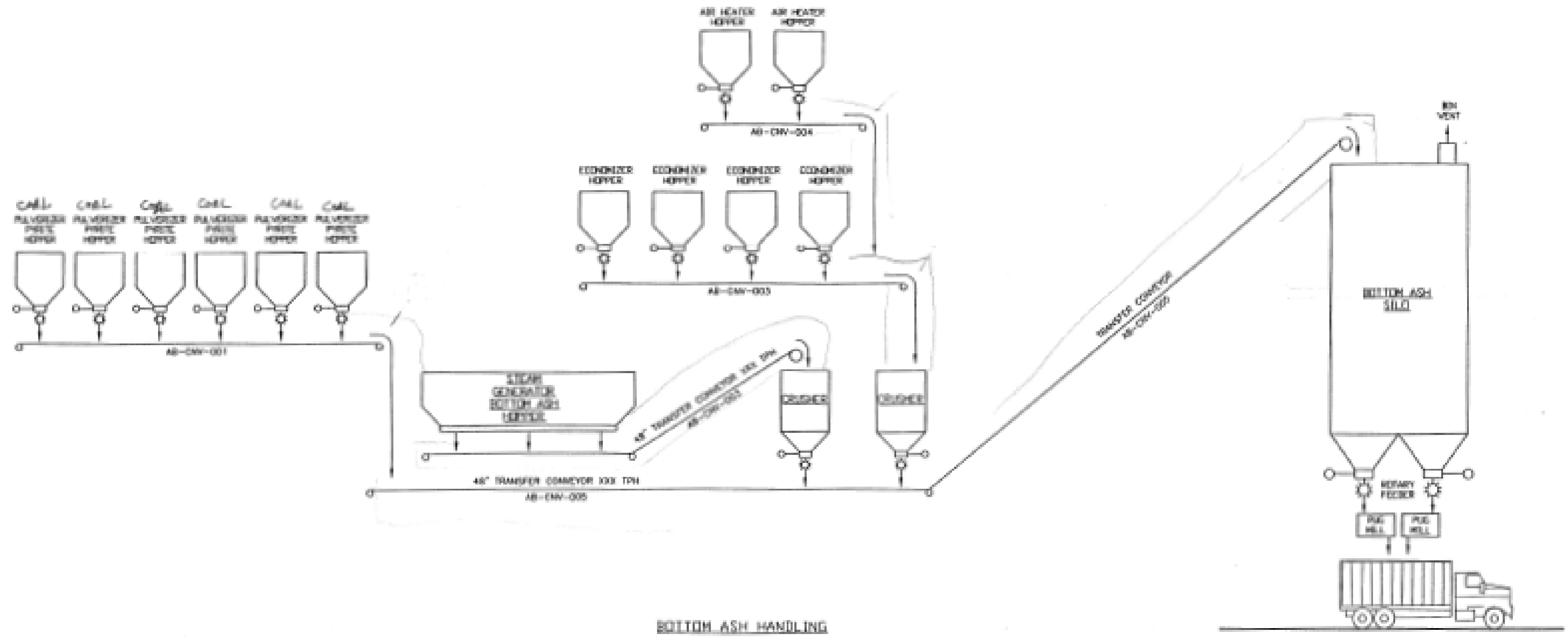
Ash Handling System Controls

Dust from the ash silo systems will be controlled by fabric filter dust collectors. Ash for sale will be conveyed pneumatically to enclosed rail cars or trucks with dust control provided by fabric filter dust collectors. Ash transported to the on-site landfill will be mixed with water in a rotary mixer to control dust during transport and disposal. The Landfill Permit will outline operating requirements to control dust. After active areas of the disposal site are filled to permitted design elevations the combustion waste will be covered with topsoil and re-vegetated.

Fly Ash Handling



Bottom Ash Handling



2.0 DESCRIPTION OF PROCESS

2.2.3 COOLING SYSTEM

Cooling System Design

The proposed cooling system design will be a hybrid system consisting of both air-cooled (dry) condensers and a mechanical draft wet cooling system. The system is designed to conserve water and to lower particulate emissions (from dissolved solids in water) when load and atmospheric conditions are favorable for heat rejection by using large volumes of air to dissipate heat. During higher load operations and when atmospheric conditions are less favorable for heat rejection, the mechanical draft wet cooling towers will be used for evaporation cooling.

Steam created in each unit will be expanded through a steam turbine and converted to water in the condenser system of each unit. The condenser is a large heat exchanger where steam is condensed. The condensate returning from the condenser will be returned to the plant as feed water to be reused in the steam cycle. Heat rejected from the condenser will be transferred to a hybrid air- and water-cooled condenser system. The water-cooled portion of the system will pump circulating water to the cooling tower, where it will be distributed through the structural fill and then fall to the bottom of the tower. The warm droplets of water will be cooled by an air flow pulled through the cooling tower by fans at the top of the cooling tower. The water may be circulated through the cooling tower several times before being discharged for treatment and reuse or disposal.

Cooling System Operation

Both cooling towers will operate efficiently at maximum capacity in a continuous duty cycle up to 8,760 hr/yr.

Cooling System Control

The air-cooled condenser will have no air emissions. The mechanical draft wet cooling towers will lose water through evaporation. The quantity of water evaporated depends on the plant generation load. As a result of this evaporation, dissolved solids will increase as a function of time. The water level in the cooling tower basin will be controlled so that the amount of water evaporated is replenished with fresh water. Particulate emissions will be controlled by minimizing the release of water droplets containing dissolved solids through the use of drift eliminators. Drift eliminators consist of a series of baffles that reduce the amount of particulate containing water droplets that can escape to the atmosphere.

2.0 DESCRIPTION OF PROCESS

2.2.4 AUXILIARY BOILER SYSTEM

Auxiliary Boiler System Design

The auxiliary boiler has a rated heat input of 220 million British thermal units per hour (MMBtu/hr) and will provide a backup steam source for startup, process needs, and building heating systems when the plant auxiliary steam system is inadequate.

Auxiliary Boiler System Operation

The auxiliary boiler may be operated during periods when one or both main boilers are off line, to supplement the auxiliary steam system when the main boilers are in startup or being removed from service and during periods when the plant auxiliary steam is not capable of meeting the heating requirements. The auxiliary boiler will be the only source of auxiliary steam for plant heating when both main boilers are off line. Typically, an auxiliary boiler does not operate more than required to meet seasonal building heating requirements and during periods when supplemental process steam is needed.

Auxiliary Boiler System Controls

The auxiliary boiler unit will be fired by No. 2 fuel oil with a sulfur content of less than or equal to 0.0015 percent. Low NOX burners (LNB) will be installed to control NOX and CO emissions. Operation of the auxiliary boiler will be limited to 4,000 hours per year.

2.0 DESCRIPTION OF PROCESS

2.2.5 ANCILLARY EQUIPMENT

Ancillary Equipment Design

Ancillary equipment includes one plant diesel engine auxiliary generator, one diesel SO2 absorber emergency quench pump, one switchyard diesel engine auxiliary generator , one diesel fire water pump, one diesel booster fire pump, and one propane spark ignited communication auxiliary generator. The plant diesel engine auxiliary generator will fire low-sulfur diesel fuel and is rated at 3,100 horsepower (hp). The diesel SO2 absorber emergency quench pump will fire low-sulfur diesel fuel and is rated at 455 horsepower. The switchyard diesel engine auxiliary generator will fire ultra low-sulfur diesel fuel and is rated at 675 hp. The diesel fire water pump will fire ultra low-sulfur diesel fuel and is rated at 525 hp. The diesel booster fire water pump will fire ultra low-sulfur diesel fuel and is rated at 60 horsepower. The spark ignited communication auxiliary generator will fire propane and is rated at 80 horsepower.

Ancillary Equipment Operation

These diesel engines are designed to operate during testing and emergency situations. Typically, these units each operate less than 250 hours per year. Each diesel engine will have a dedicated diesel fuel storage tank. The propane spark ignited communication auxiliary generator typically operates less than 4,000 hours per year.

Ancillary Equipment Controls

These diesel engines will be supplied with current combustion controls and fired by ultra low-sulfur distillate oil with a sulfur content less than or equal to 0.0015 percent and will have combustion controls to minimize NO_x and CO emissions. Their operation will be limited to 250 hours per year. The propane spark ignited communication auxiliary generator will be limited to 4,000 hours per year.

3.0 APPLICABLE REQUIREMENTS

Applicable requirements are those regulatory requirements that apply to a stationary source or to emissions units contained within the stationary source. In Nevada's program, the regulations governing the emissions of air pollutants from which the applicable requirements originate are derived from four categories of regulations. These four categories consist of the requirements contained in the Nevada Revised Statutes (NRS), the Nevada Administrative Code (NAC), the Applicable State Implementation Plan (ASIP), and the Code of Federal Regulations (CFR, contained in various Parts within Title 40).

3.1 GENERALLY APPLICABLE REQUIREMENTS

Of the four categories of regulations governing emissions of air pollutants, there are many generally applicable requirements that apply to stationary sources and emission units located at a stationary source. A comprehensive summary of all the generally applicable permit requirements is contained in Sections I through V of the proposed operating permit to construct provided in Attachment 3.

3.2 SPECIFIC APPLICABLE REQUIREMENTS

The remainder of this section of the review will focus on specific applicable requirements associated with each emission unit or process at the EEC. A list of the emission units, as identified in the application and a summary of the specific applicable requirements is contained in Table 3.2.1 below.

3.0 APPLICABLE REQUIREMENTS

TABLE 3.2.1

EU #	Unit Description	NAC (445B)	NSPS (40 CFR Part 60)	NESHAPS (40 CFR Parts 61, 63)	Acid Rain (40 CFR Parts 72-78)
S2.001 & S2.002	Pulverized Coal Utility Boilers	.3405, .305, .22017, .2202, .2203, .22047	Subpart Da: Subpart HHHH:	N/A	72.6, 73 et seq., 75 et. seq., 77 et. Seq and 78 et. Seq.
S2.003	Auxiliary Boiler	.3405, .305, .22017, .2202, .2203, .22047,	Subpart Db	N/A	72.6, 73 et seq., 75 et. seq., 77 et. Seq and 78 et. Seq.
S2.004	Emergency Generator Engine	.3405, .305, .22017	Subpart IIII (CI ICE)	N/A	N/A
S2.005	Emergency Generator Engine	.3405, .305, .22017	Subpart IIII (CI ICE)	N/A	N/A
S2.006	Emergency Firewater Pump	.3405, .305, .22017, .22033	Subpart IIII (CI ICE)	N/A	N/A
S2.007	Emergency Firewater Booster Pump	.3405, .305, .22017, .22033	Subpart IIII (CI ICE)	N/A	N/A
S2.008	Emergency Absorber Pump	.3405, .305, .22017, .22033	Subpart IIII (CI ICE)	N/A	N/A
S2.009 & PF1.001	Coal Unloading Building	.3405, .305, .22017, .22033	Subpart Y	N/A	N/A
S2.010	Transfer Tower #1	.3405, .305, .22017, .22033	Subpart Y	N/A	N/A
S2.011	Coal Storage Dome #1	.3405, .305, .22017, .22033	Subpart Y	N/A	N/A
S2.012	Coal Storage Dome #2	.3405, .305, .22017, .22033	Subpart Y	N/A	N/A
PF1.002	Coal Transfer Operations	.3405, .305, .22017, .22033	Subpart Y	N/A	N/A
S2.013	Transfer Tower #2	.3405, .305, .22017, .22033	Subpart Y	N/A	N/A
S2.014	Coal Crushing Building	.3405, .305, .22017, .22033	Subpart Y	N/A	N/A
S2.015	Transfer Tower #3	.3405, .305, .22017, .22033	Subpart Y	N/A	N/A
S2.016 & S2.017	Coal Silo #1	.3405, .305, .22017, .22033	Subpart Y	N/A	N/A

3.0 APPLICABLE REQUIREMENTS

TABLE 3.2.1 (continued)

EU #	Unit Description	NAC (445B)	NSPS (40 CFR Part 60)	NESHAPS (40 CFR Parts 61, 63)	Acid Rain (40 CFR Parts 72-78)
S2.018 & S2.019	Coal Silo #2	.3405, .305, .22017, .22033	Subpart Y	N/A	N/A
S2.020, PF1.003 & PF1.004	Limestone Unloading Building	.3405, .305, .22017, .22033	N/A	N/A	N/A
S2.021	Limestone Hoppers and Tunnel	.3405, .305, .22017	N/A	N/A	N/A
S2.022 & PF1.005	Limestone Preparation Building	.3405, .305, .22017	N/A	N/A	N/A
S2.023 & PF1.006	Limestone Silo A	.3405, .305, .22017, .22033	N/A	N/A	N/A
S2.024 & PF1.007	Limestone Silo B	.3405, .305, .22017, .22033	N/A	N/A	N/A
PF1.008	Gypsum Stockout Conveyor Transfer Point	.3405, .305, .22017, .22033	N/A	N/A	N/A
S2.025	Fly Ash #1 Operations	.3405, .305, .22017, .22033	N/A	N/A	N/A
S2.026	Fly Ash #1 Operations	.3405, .305, .22017, .22033	N/A	N/A	N/A
S2.027	Bottom Ash Silo #1 Operations	.3405, .305, .22017, .22033	N/A	N/A	N/A
S2.028	Bottom Ash Silo #2 Operations	.3405, .305, .22017, .22033	N/A	N/A	N/A
S2.029 & S2.030	Dry Sorbent Storage Silo	.3405, .305, .22017, .22033	N/A	N/A	N/A
S2.031	Soda Ash Storage Silo	.3405, .305, .22017, .22033	N/A	N/A	N/A
S2.032	Magnesium Hydroxide Storage Silo	.3405, .305, .22017, .22033	N/A	N/A	N/A
S2.033	Hydrated Lime Storage Silo	.3405, .305, .22017, .22033	N/A	N/A	N/A
PF1.009 & PF1.010	Cooling Tower System	.3405, .305, .22017, .22033	N/A	N/A	N/A

3.0 APPLICABLE REQUIREMENTS

TABLE 3.2.1 (continued)

EU #	Unit Description	NAC (445B)	NSPS (40 CFR Part 60)	NESHAPS (40 CFR Parts 61, 63)	Acid Rain (40 CFR Parts 72-78)
S2.034	Distillate Fuel Storage Tank	.305, .22017	N/A	N/A	N/A
S2.035	Distillate Fuel Storage Tank	.305, .22017	N/A	N/A	N/A
S2.036	Distillate Fuel Storage Tank	.305, .22017	N/A	N/A	N/A
S2.037	Distillate Fuel Storage Tank	.305, .22017	N/A	N/A	N/A
S2.038 & S2.039	Packed Activated Carbon Storage Silos	.305, .22017	N/A	N/A	N/A
S2.040 & S2.041	Reclaim Coal Tunnels and Conveyors	.3405, .305, .22017, .22033	Subpart Y	N/A	N/A

3.0 APPLICABLE REQUIREMENTS

3.2.1 NEVADA REVISED STATUTES

The Nevada Revised Statutes (NRS) is the statutory authority for the adoption and implementation of administrative regulations. The statutes relating to the control of air pollution are contained in NRS 445B.100 through 445B.640. The NRS specifies that the State Environmental Commission is the governing body given the power to adopt administrative regulations. Because the NRS is the enabling statutory authority, very few specific requirements are contained in the statutes. Rather, the NRS provides, generally, broad authority for the adoption and implementation of air pollution control regulations.

3.2.2 NEVADA ADMINISTRATIVE CODE

The Nevada Administrative Codes (NAC) are administrative regulations that contain specific requirements relating to the control of air pollution. The State Environmental Commission adopts these regulations. The NAC requires that, where state regulations are more stringent in comparison to Federal regulations, the State regulations are applicable. The NAC sets forth, by rule, maximum emission standards for visible emissions (opacity), PM10 and sulfur emitting processes as well as implementing the federal Clean Air Mercury Rule (CAMR) regulations. Other requirements are established for incinerators, storage tanks, odors and maximum concentrations of regulated air pollutants in the ambient air. Other NAC regulations specify the requirements for applying for and method of processing applications for operating permits. All of the equipment considered in this application must meet, at a minimum, the applicable standards and requirements set forth in the NAC. Specifically, the emission standards contained in NAC 445B.22027 through .22033 for particulate matter, 445B.2204 through .22047 for sulfur emissions, 445B.22017 for opacity, and 445B.310 for the ambient air quality standards must not be exceeded.

3.2.3 NEVADA APPLICABLE SIP (ASIP)

The Applicable State Implementation Plan (ASIP) is a document that is prepared by a State or Local air regulatory agency and required to be submitted to the U.S. EPA for approval. Title I of the Clean Air Act is the statutory authority for the U.S. EPA regulations that require a State to submit a SIP. The contents of the SIP are intended to show how a State, through the implementation and enforcement of the regulations contained in the SIP, will either show how attainment of the ambient air quality standards (NAAQS) will be achieved or how a State will continue to maintain compliance with the NAAQS. Nevada has an updated SIP currently being reviewed by EPA, Region IX. Parts of this updated SIP have been approved.

3.0 APPLICABLE REQUIREMENTS

3.2.4 CODE OF FEDERAL REGULATIONS (CFR)

The Code of Federal Regulations (CFR) are regulations adopted by the U.S. EPA and published in the Federal Register pursuant to the authority of the granted by Congress in the Clean Air Act. The CFR addresses multiple aspects, including but not limited to, permitting requirements, performance standards, testing methods, and monitoring requirements.

3.2.4.1 New Source Performance Standards (NSPS)

The U.S. EPA has promulgated maximum emission standards and/or monitoring/recordkeeping methods for selected source categories. These standards are contained in Title 40 of the CFR, Part 60, and are known as the New Source Performance Standards (NSPS). The PC Utility Boiler is subject to Subpart Da and Subpart HHHH, the Auxiliary Boilers are subject to Subpart Db, the emergency diesel generators and the emergency diesel fire pumps are subject to Subpart IIII, various coal handling processes are subject to Subpart Y. The fuel storage tanks, because of the low vapor pressure of the liquid stored, is exempt from the requirements of Subpart Kb.

3.2.4.2 National Emission Standards for Hazardous Air Pollutants (NESHAP)

The federal NESHAP requirements are found in two parts of the 40 CFR: Part 61 and Part 63.

Part 61, which predates the Clean Air Act Amendments of 1990, includes specific standards, reporting and recordkeeping requirements, and test methods for the initial eight hazardous air pollutants: asbestos, benzene, beryllium, coke oven emissions, inorganic arsenic, mercury, radionuclides, and vinyl chloride. The regulations covering these eight hazardous air pollutants focused on health-based considerations. NESHAP's were established for certain operations that commonly emit the eight hazardous air pollutants.

Other substances were included for consideration due to the serious health effects, including cancer, which may occur from ambient air exposure to those substances. However, no specific restrictions were placed on facilities that used or released these compounds.

Under the Clean Air Act Amendments of 1990, Congress greatly expanded the Air Toxics program, creating a list of 189 substances to be regulated as hazardous air pollutants. Rather than regulating individual pollutants by establishing health-based standards, the new Air Toxics program granted EPA the authority to regulate specific industrial major source categories with NESHAP's based on maximum achievable control technology (MACT) for each source category. Thus, a number of NESHAP's have been established to regulate specific categories of stationary sources that emit (or have the potential to emit) one or more hazardous air pollutants.

3.0 APPLICABLE REQUIREMENTS (Continued)

3.2.4.2 National Emission Standards for Hazardous Air Pollutants (NESHAP) (cont.)

The standards in 40 CFR Part 63 are independent of the NESHAP's contained in 40 CFR Part 61 which remain in effect until they are amended, if appropriate, and added to this part. More information on NESHAP's can be found at the EPA Unified Air Toxics Website.

NESHAP's may cover both major sources and area sources in a given source category. Major sources are defined as those facilities emitting, or having the potential to emit, 10 tons per year or more of one Hazardous Air Pollutant (HAP) or 25 tons per year or more of multiple HAP's. Major sources are required to comply with MACT standards. Area sources are defined as those facilities that are not major sources.

SPRC's OPTC application has identified two individual HAP's as having the potential to emit greater than the 10 tons per year threshold, i.e. Hydrogen Chloride and Hydrogen Fluoride, at 847.8 and 30.53 tons per year respectively. Major source status for HAP's for the proposed SPRC facility will subject SPRC to any applicable NESHAP/MACT source standards.

In October (10/28/05), EPA published two reconsideration notices in the Federal Register related to the Agency's Clean Air Mercury Rule (CAMR), which was signed on March 15, 2005. The first notice dealt with the rule itself, which will regulate Hg emissions from new and existing electric generating units (EGUs). Issues that the Agency stated in its intent to re-consider include:

- Phase I (2010) statewide Hg emission budgets and the unit-level allocations on which the budgets were based.
- Definition of "designated pollutant" under 40 CFR 60.21
- EPA's sub-categorization of EGUs that burn sub-bituminous coal
- Statistical analysis used to set NSPS emission limits
- Hg content in coal used to establish NSPS emission limits
- Definition of covered units as including municipal waste combustors
- Definition of covered units as including some industrial boilers.

The second notice dealt with the Agency's revision of its December 2000 regulatory finding on the emissions of hazardous air pollutants from electric utility generating units and the removal of coal- and oil-fired electric generating units from the Clean Air Acts Amendments (CAA) Section 112(c) list. This decision was published in the Federal Register on March 29, 2005.

The utility boiler HAP PTE counts towards facility-wide HAP PTE and other category MACT regulations apply to other applicable emission units. The emergency diesel generator is subject to 40 CFR, Subpart ZZZZ (initial notification requirements only).

3.0 APPLICABLE REQUIREMENTS

3.2.4.3 Prevention of Significant Deterioration Regulations (PSD)

Implementation of the federal PSD regulations is delegated to the State of Nevada by U.S. EPA and these regulations are contained at 40 CFR Part 52.21. Therefore, BAPC implements the federal PSD regulations directly. These regulations specify federally required permitting procedures for each "major stationary source". The PSD regulations define a "stationary source" as "*any building, structure, facility, or installation which emits or may emit any air pollutant subject to regulation under the Act.*" A "building structure facility or installation" is defined as "*all of the pollutant-emitting activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person (or persons under common control) except the activities of any vessel. Pollutant-emitting activities shall be considered as part of the same industrial grouping if they belong to the same 'Major Group' (i.e., which have the same first two digit code) as described in the Standard Industrial Classification Manual, 1972, as amended by the 1977 Supplement.*"

“Major” is defined as the potential to emit of a stationary source, which equals or exceeds a specified threshold (in tons per year) of any air pollutant regulated under the Clean Air Act (40 CFR 52.21(b)(1)). The first threshold is for a stationary source that emits or has the potential to emit 100 tons per year or more of any regulated NSR pollutant and is defined as one of 28 specific categories of sources (see 40 CFR 52.21(b)(1)(i)(a)). The other applicability threshold is for any other stationary source that emits or has the potential to emit 250 tons per year of any regulated NSR pollutant (see 40 CFR 52.21(b)(1)(i)(b)). As mentioned above, the SIC code for this facility is 4911. Therefore, the major SIC grouping is 49, which is identified as "Electric, Gas, and Sanitary Services" in the SIC manual. Major stationary source status is classified at the 100 tons per year emission threshold for any regulated NSR pollutant as SPRC is identified as one of the 28 source categories. As identified in Section 4.0 of this review, the SPRC facility has the potential to emit greater than the 100 tons per year threshold for several NSR regulated pollutants and, as such, is classified as a major stationary source for PSD purposes.

3.0 APPLICABLE REQUIREMENTS (Continued)

3.2.4.3 Prevention of Significant Deterioration Regulations (PSD) (cont.)

Pursuant to the provisions set forth in 40 CFR §52.21(c)(j)(2), a PSD review is triggered in certain instances when emissions associated with a new major source or emissions increases resulting from a major modification are "significant."

"Significant" emissions thresholds are defined two ways. The first is in terms of emission rates (tons/year). The second type of "significant" emissions threshold is defined as any emissions rate at a new major stationary source (or any net emissions increase associated with a modification to an existing major stationary source) that is constructed within 10 kilometers of a Class I area, and which would increase the 24-hour average concentration of any regulated NSR pollutant in that area by 1 $\mu g/m^3$ or greater.

40 CFR 52.21(b)(23)(i) lists the pollutants for which significant emissions rates have been established.

(1) For a new source (i.e., EEC) which is major for at least one regulated attainment or noncriteria pollutant, (i.e., is subject to PSD review), all pollutants for which the area is not classified as nonattainment and which are emitted in amounts equal to or greater than those specified in 40 CFR 52.21(b)(23)(i) (≥ significant threshold) are also subject to PSD review.

3.0 APPLICABLE REQUIREMENTS (Continued)

3.2.4.4 Acid Rain

The Clean Air Act Amendments of 1990 (Title IV) established a requirement to reduce the emissions of pollutants contributing to acid rain (SO_2 and NO_x). It also established a market-based emissions trading program for SO_2. U.S. EPA is responsible for developing regulations and implementing the requirements of the acid rain provisions of the Clean Air Act Amendments. As a result, U.S. EPA adopted acid rain related regulations at 40 CFR Parts 72 through 78.

The overall goal of the Acid Rain Program is to achieve environmental and public health benefits through reductions in emissions of SO_2 and NO_x. To achieve this goal, the program employs both traditional and innovative, market-based approaches for controlling air pollution. Title IV of the Clean Air Act sets as its primary goal the reduction of annual SO_2 emissions by 10 million tons below 1980 levels. To achieve these reductions, the law requires a two-phase tightening of the restrictions placed on fossil fuel-fired power plants.

Phase I began in 1995 and affects 263 units at 110 mostly coal-burning electric utility plants located in 21 eastern and Midwestern states. An additional 182 units joined Phase I of the program as substitution or compensating units, bringing the total of Phase I affected units to 445. Emissions data indicate that 1995 SO_2 emissions at these units nationwide were reduced by almost 40% below their required level.

Phase II, began in the year 2000, tightens the annual emissions limits imposed on these large, higher emitting plants and also sets restrictions on smaller, cleaner plants fired by coal, oil, and gas, encompassing over 2,000 units in all. The program affects existing utility units serving generators with an output capacity of greater than 25 megawatts and all new utility units.

The NO_x program embodies many of the same principles of the SO_2 trading program in its design: a results-orientation, flexibility in the method to achieve emission reductions, and program integrity through measurement of the emissions. However, it does not "cap" NO_x emissions as the SO_2 program does, nor does it utilize an allowance trading system. The Act calls for a 2 million ton reduction in NO_x emissions by the year 2000. A significant portion of this reduction will be achieved by coal-fired utility boilers that will be required to install low NO_x burner technologies and to meet new emissions standards.

SPRC's PC Utility Boilers are subject to the provisions of the Acid Rain Program. SPRC will be submitting an Acid Rain Permit Application within the appropriate time frames.

4.0 EMISSIONS INVENTORY

4.1 EMISSIONS

See the following tables for a detailed list of the all facility's permitted emission limits. A PSD review is triggered in certain instances when emissions associated with a new major source or emissions increases resulting from a major modification are "significant". For a new source proposed to be located in an "attainment area" which is major for at least one regulated NSR pollutant, all pollutants for which the area is not classified as "non-attainment" and which are emitted in amounts equal to or greater than the "de-minimus threshold level", are also subject to PSD review. Table 4.1 below is a facility-wide potential emission summary and a comparison to the Significant Emission Rates from the *New Source Review Workshop Manual*, (USEPA, 1990 Draft). Table 4.2 shows potential emission rates from each unit. From these Tables it is evident that the EEC will be designated a major stationary source for PM, PM_{10}, NO_x, SO_2, CO, VOC's, Pb, H_2SO_4 mist, and HF.

BAPC's calculations generally agree with SPRC's calculated potential to emit. BAPC is including estimates of emissions for wind erosion from the coal pile(s) and the ash disposal area in the tables below. The BAPC has reviewed and agrees with SPRC's emission estimates for these areas.

Hazardous Air Pollutants (HAPs) generated at the facility include HCl, HF, Manganese (Mn) and Formaldehyde. The PC Boiler emits HCl and HF as the primary HAP components.

Table 4.1: Facility Wide Potential to Emit (Ton/Year)

Pollutant	Potential to Emit (Ton/Year)	PSD Significant Emission Rate (ton/yr) 40 CFR 52.21(b)(23)(i)
PM	1,788	25.0
PM_{10} (filterable & condensable)	1,788	15.0
SO_2	4,628	40.0
CO	7,720	100.0
NO_x	4,853	40.0
VOC	285	40.0
Pb	2.0	0.6
H_2SO_4 Mist	305	7.0
HF	30.5	3.0 (total Fluoride)

Table 4.2: Potential to Emit by Permit System

5.0 PREVENTION OF SIGNIFICANT DETERIORATION DETERMINATION

As discussed above, 40 CFR Part 52.21 specifies that Prevention of Significant Deterioration (PSD) review is required for any new major stationary source or any major modification. A major stationary source is defined as any pollutant emitting activities, which belong to the same two digit Source Industry Classification (SIC), and:

1. emits 100 tons/yr or more of a regulated air contaminate as 1 of the 28 listed categories of sources listed in 40 CFR 52.21; or

2. emits 250 tons/yr or more of a regulated air contaminant and belong to any other category sources.

The SPRC facility is classified as 1 of the 28 listed categories of sources and the total potential to emit of a single NSR regulated pollutant exceeds 100 tons/yr. Therefore, the facility will be a PSD major stationary source. It should be noted that the Minor Source baseline dates for the hydrographic area (HA - 179), Steptoe Valley, in which this facility is proposing to locate, has been previously triggered for the following pollutants:

- Steptoe Valley - 06/04/1979 for PM_{10}.
- Steptoe Valley - 12/28/2006 for NO_x.
- North Steptoe Valley - 11/28/1984 for SO_2.
- Middle Steptoe Valley - 12/28/2006 for SO_2.

Any modification of the facility that increases the emissions above the applicable significant emission threshold will require a new PSD/NSR review of the source. As such, additional emissions from this facility will consume increment (please see the discussion in Section 6).

5.0 PREVENTION OF SIGNIFICANT DETERIORATION DETERMINATION

SPRC is required to submit a Best Achievable Control Technology (BACT) Analysis as part of their PSD application. SPRC has evaluated BACT, using the top-down approach, for each of the pollutants identified in Section 4, above, as being above the significance threshold. A top-down BACT analysis consists of the following:

- Identification of the available control technologies;
- Elimination of the technically infeasible control options;
- Ranking of the remaining control technologies in order from the most effective to the least effective;
- Evaluation of the most effective control option for economic, energy and environmental impacts, and if it is not eliminated on these impacts, acceptance of the technology as BACT; if not, evaluate the next most effective control option in the ranking; and
- Selection of the most effective control option not eliminated for economic or environmental impacts.

SPRC's BACT analysis is included in the application as Appendix B. BAPC concurs with SPRC's analysis. The following is a summary of each pollutant and selected BACT for each unit requiring a BACT analysis.

5.1 Pulverized Coal-fired Utility Boiler

5.1.1 NO_x BACT Analysis

SPRC has selected Selective Catalytic Reduction (SCR) in series with Low NO_x Burners (LNB) and Over-Fired Air (OFA) as the BACT technology for controlling NO_x emissions from the PC boiler. SPRC is proposing an emission limit of 0.06 lb/MMBtu on a 24-hour rolling average for the PC boiler. This technology is consistent and the proposed emission limit is lower or equivalent than BACT selected in other projects on the RBLC database and EPA Region 4's PC Boiler Tables.

5.1.2 CO BACT Analysis

SPRC has selected good combustion practices as the BACT technology for controlling CO emissions from the PC boiler. SPRC is proposing an emission limit of 0.10 lb/MMBtu on a 24-hour rolling average for the PC boiler. This technology and emission limit is consistent with BACT selected in other similar projects on the RBLC database and EPA Region 4's PC Boiler Tables.

5.0 PREVENTION OF SIGNIFICANT DETERIORATION DETERMINATION

5.1 Pulverized Coal-fired Utility Boiler (cont.)

5.1.3 SO_2 BACT Analysis

SPRC has selected a wet scrubbing system as the BACT technology for controlling SO_2 emissions from the PC boiler. It is the BAPC's position that BACT for SO_2 emissions from a PC Boiler located in the western United States is dry scrubbing. SPRC's proposed use of wet scrubbing to control SO_2 emissions from a PC Boiler is above and beyond BACT technology, and may, more appropriately, be considered LAER technology. SPRC is proposing an emission limit of 0.06 lb/MMBtu on a 24-hour rolling average for the PC boiler. This technology is consistent and the proposed emission limit is lower than BACT selected in other similar projects on the RBLC database and EPA Region 4's PC Boiler Tables.

5.1.4 PM/PM_{10} BACT Analysis

SPRC has selected Fabric Filter Dust Collection as the BACT technology for controlling particulate emissions from the PC boiler. SPRC is proposing an emission limit of 0.01 lb/MMBtu, for PM filterable and 0.02 lb/MMBtu, both filterable and condensable for PM_{10}, on a 24-hour average for the PC boiler. This technology and emission limit is consistent with BACT selected in other projects on the RBLC database and EPA Region 4's PC Boiler Tables.

5.1.5 H_2SO_4 mist and HF BACT Analyses

SPRC has selected a wet flue gas desulfurization and a fabric filter/baghouse as the BACT technology for controlling emissions of H_2SO_4 mist and HF from the PC boiler. SPRC is proposing an emission limit of 0.004 lb/MMBtu, on a 3-hour average for H_2SO_4 mist and 0.0004 lb/MMBtu for HF, on a 3-hour average, respectively, for the PC Boiler. This technology and emission limits are consistent with BACT selected in other projects on the RBLC database and EPA Region 4's PC Boiler Tables.

5.0 PREVENTION OF SIGNIFICANT DETERIORATION DETERMINATION

5.1 Pulverized Coal-fired Utility Boiler (cont.)

5.1.6 VOC BACT Analysis

SPRC has selected good combustion practices as the BACT technology for controlling VOC emissions from the PC boiler. SPRC is proposing an emission limit of 0.003 lb/MMBtu, on a 3-hour average for the PC boiler. This technology and emission limit is consistent with BACT selected in other projects on the RBLC database and EPA Region 4's PC Boiler Tables.

5.1.7 Pb BACT Analysis

SPRC has selected Fabric Filter Dust Collection as the BACT technology for controlling Pb emissions from the PC boiler**.** SPRC is proposing an emission limit of 2.6 x 10^{-5} lb/MMBtu, on a 3-hour average for the PC boiler. This technology and emission limit is consistent with BACT selected in other projects on the RBLC database and EPA Region 4's PC Boiler Tables.

5.2 Distillate fuel-fired Auxiliary Boilers

The auxiliary boiler for the EEC facility will consist of a 220 MMBtu/hr, distillate oil-fired boiler running with fuel sulfur content limited to 0.0015 percent. The auxiliary boiler will run infrequently. The BACT summary for NO_x, SO2, H2SO4, CO, VOC's, and PM/PM10 is presented below.

5.2.1 NO_x BACT Analysis

The RBLC database reveals that the typical BACT for NO_x emissions control from distillate oil fired auxiliary boilers with infrequent operation includes LNB's (EPA 2006a). Additional NO_x removal technologies such as SCR or SNCR are prohibitively costly to install on an auxiliary boiler with infrequent operation.

Of the technologies listed in the RBLC database, LNB achieves emission limits ranging from 0.1 lb/MMBtu (for LNB alone) to 0.4 lb/MMBtu (for LNB with other control technologies) on boilers ranging in size from 120 to 175 MMBtu/hr. LNB's are proposed as BACT for NO_x control on the auxiliary boiler, with an emission limit of 0.1 lb/MMBtu. This emission limit is consistent with the range of recently permitted auxiliary boilers.

5.0 PREVENTION OF SIGNIFICANT DETERIORATION DETERMINATION

5.2 Distillate fuel-fired Auxiliary Boilers (cont.)

5.2.2 SO_2 BACT Analysis

The RBLC database reveals that typical BACT for SO_2 emissions control from distillate oil-fired auxiliary boilers include low-sulfur fuel and good combustion practices. Additional SO_2 removal technologies such as FGD are prohibitively costly to install on an auxiliary boiler with infrequent operation and have never been approved as BACT for boilers firing low-sulfur fuels and with infrequent operation.

Of the technologies listed in the RBLC database, limiting fuel sulfur content achieves the lowest emission limits, ranging from 0.051 to 0.8 lb/MMBtu for boilers ranging in size from 117 to 175 MMBtu/hr. Limiting fuel sulfur content to 0.0015 percent is proposed as the BACT for SO_2 control on the auxiliary boiler, with an emission limit of 0.05 lb/MMBtu. This emission limit is consistent with the range of recently permitted auxiliary boilers.

5.2.3 H_2SO_4 mist and HF BACT Analyses

The RBLC database reveals that the typical BACT for H_2SO_4 emissions control from distillate oil-fired auxiliary boilers includes low-sulfur fuel. Additional H_2SO_4 removal technologies such as FGD are prohibitively costly to install on an auxiliary boiler with infrequent operation and have never been approved as a BACT for boilers firing low-sulfur fuels and with infrequent operation.

Of the technologies listed in the RBLC database, limiting fuel sulfur content achieves the lowest emission limits, ranging from 0.0008 to 0.0025 lb/MMBtu for boilers ranging in size from 104 to 175 MMBtu/hr. Limiting fuel sulfur content to 0.0015 percent is proposed as the BACT for H_2SO_4 control on the auxiliary boiler.

5.2.4 Carbon Monoxide

The RBLC database reveals that the typical BACT for CO emissions control from distillate oil fired auxiliary boilers is good combustion practices.

Of the technologies listed in the RBLC database, emission limits for facilities using good combustion practices as the BACT range from 0.036 to 0.38 lb/MMBtu. Use of good combustion practices and ultra low sulfur fuel is proposed as the BACT for CO control on the auxiliary boiler, with an emission limit of 0.036 lb/MMBtu. This emission limit is consistent with the range of recently permitted auxiliary boilers.

5.0 PREVENTION OF SIGNIFICANT DETERIORATION DETERMINATION

5.2 Distillate fuel-fired Auxiliary Boilers (cont.)

5.2.5 Volatile Organic Compounds

The RBLC database reveals that the typical BACT for VOC emissions control from distillate oil fired auxiliary boilers includes good combustion.

Emission limits for facilities using good combustion practices as the BACT range from 0.001 to 0.03 lb/MMBtu. Use of good combustion practices is proposed as the BACT for VOC control on the auxiliary boiler, with an emission limit of 0.0018 lb/MMBtu. This emission limit is consistent with the range of recently permitted auxiliary boilers.

5.2.6 Particulate Matter (PM and PM_{10})

The RBLC database reveals that typical BACT's for PM/PM_{10} emissions control from distillate oil fired auxiliary boilers include low-ash fuel, low-sulfur fuel, LNB's, fabric filters, and good combustion practices.

Of the technologies listed in the RBLC database, limiting fuel ash content achieves the lowest PM emission limit of 0.0071 (PM_{10}) lb/MMBtu for a 175 MMBtu/hr boiler. The low-sulfur fuel proposed for use at the EEC facility is also a low-ash fuel, with typical ash content varying from “trace” to 0.03 percent by weight. Use of low-sulfur and low-ash fuel is the proposed BACT for PM/PM_{10} control on the auxiliary boiler, with a filterable PM emission limit of 0.02 lb/MMBtu, a condensable PM emission limit of 0.02 lb/MMBtu, and an opacity limit of 20 percent. These emission limits are consistent with the range of recently permitted auxiliary boilers.

5.3 Distillate fuel-fired Emergency Engines (Generator and Fire Pump)

Good combustion practices and use of engines that adhere to specifications set forth for manufacturers in 40 CFR Part 60, Subpart IIII, is considered BACT for NO_x, CO, VOC's, and PM. These emission limits and control technologies are consistent with those in the RBLC database.

The method for limiting SO_2 and H_2SO_4 emissions is limiting fuel sulfur content. This control method offers the highest level of control, and additional controls have never been approved as BACT's; therefore, the BACT for SO_2 and H_2SO_4 control for the diesel engine generators and fire pumps is the limiting of fuel sulfur content to 0.0015 percent, in accordance with 40 CFR Part 60, Subpart IIII. This emission limit and control technology is consistent with those in the RBLC database.

5.0 PREVENTION OF SIGNIFICANT DETERIORATION DETERMINATION

5.4 Material Handling and Storage Facilities

The proposed EEC facility will use a combination of dust collectors, enclosures, telescopic chutes, lowering wells, wet suppression techniques, and seeding and/or crusting agents as BACT for material handling and storage operations. All baghouses will have an outlet grain loading of 0.005 grains per dry standard cubic foot (grains/dscf). Emissions from transfer points will be reduced by 89 to 90 percent through the use of dust collectors and partial enclosures. Storage pile emissions will be reduced by 80 to 90 percent by water sprays, surfactants, crusting agents, and seeding agents. Fugitive emissions from the coal stockout pile will be reduced by 80 percent through the use of a telescopic chute with wet suppression, and fugitive emissions from the limestone stockout pile will be reduced by 75 percent by a lowering well. Fugitive haul road emissions will be reduced by 80 percent through the application of a chemical dust suppressant and/or paved roads. The emission limit of 0.005 grains/dscf and proposed control technologies are consistent with the recently permitted facilities in the RBLC database.

5.5 Cooling Towers

Droplets of water (drift) containing dissolved and suspended solids become entrained in the exhaust gas of the cooling towers. As the moisture from these droplets evaporates, PM_{10} emissions result.

The only available technology to control the PM_{10} emissions from cooling towers is the use of drift eliminators. Drift eliminators are widely used and are technically feasible to control PM_{10} emissions from cooling towers.

Drift eliminators are capable of achieving a control efficiency of 0.0005 percent (gallons of drift per gallon of cooling water). The proposed BACT for cooling tower control of PM10 emissions at the EEC facility is the use of drift eliminators with an efficiency of 0.0005 percent (gallons of drift per gallon of cooling water). The RBLC database confirms that drift eliminators with an efficiency of 0.0005 percent have historically been accepted as the BACT for cooling towers.

BACT Emission Limits/Technology Requirement Summary

System		NO_x	CO	SO_2	PM/PM_{10}	H_2SO_4	HF
PC Boiler	Technology	SCR, LNB & OFA	Good Combustion Practices	Wet Scrubber	Baghouse	Wet Scrubber & Baghouse	Wet Scrubber & Baghouse
	Limit	0.06 lb/MMBtu	0.10 lb/MMBtu	0.06 lb/MMBtu	0.01 / 0.02 (total) lb/MMBtu	0.004 lb/MMBtu	0.0004 lb/MMBtu
	Averaging Period	24-hour rolling	24-hour rolling	24-hour rolling	3-hour average	3-hour average	3-hour average
Distillate fuel-fired Auxiliary Boilers (each)	Technology	LNB	Good Combustion Practices	Ultra Low Sulfur Distillate Fuel	Ultra Low Sulfur Distillate Fuel	Ultra Low Sulfur Distillate Fuel	–
	Limit	0.10 lb/MMBtu	0.036 lb/MMBtu	0.05 lb/MMBtu	0.02 / 0.02 (total) lb/MMBtu	–	–
	Averaging Period	3-hour average	3-hour average	3-hour average	3-hour average		–
Distillate fuel-fired Emergency Engines (Generator, Fire Pump)	Technology	Good Combustion Practices	Good Combustion Practices	Ultra Low Sulfur Distillate Fuel	Good Combustion Practices	Ultra Low Sulfur Distillate Fuel	–
	Limit	37.0, 7.3 lb/hr	23.1, 4.5 lb/hr	0.004, 0.003 lb/hr	1.3, 0.3 lb/hr	–	–
	Averaging Period	3-hour average	3-hour average	3-hour average	3-hour average	–	–
Ash, Gypsum & Quicklime Silos	Technology	Baghouse	–	–	–	–	–
	Limit	0.005 gr/dscf	–	–	–	–	–
Coal Handling	Technology	Baghouse	–	–	–	–	–
	Limit	0.005 gr/dscf	–	–	–	–	–
Haul Roads/ Surface Disturbance	Technology	paved & water sprays	–	–	–	–	–

6.0 AMBIENT AIR QUALITY IMPACT

The air quality impact analysis (AQIA) was completed by Tetra Tech EM Inc. on the behalf of the SPRC for the Nevada Division of Environmental Protection - Bureau of Air Pollution Control (NDEP-BAPC) in support of the application for a Class I Operating Permit to Construct in accordance with *Nevada Administrative Code* (NAC) 445B.289.

The Class II area impact analysis includes an evaluation of Prevention of Significant Deterioration (PSD) increments in the vicinity of Ely and an evaluation of National and Nevada Ambient Air Quality Standards (AAQS).

Section 6.1 of this report discusses the Class II area air impact analysis and Section 6.2 discusses the Class I area air impact analysis, which is also known as the long-range air impact analysis.

6.1 Class II Area Air Impact Analysis

Dispersion modeling of criteria pollutants was performed to estimate the ambient air quality impacts from the proposed EEC. Modeling was conducted to estimate the PSD increment consumption and total pollutant concentrations resulting from industrial and other pollutant emission sources in the vicinity of the EEC. The modeling evaluated incremental impacts of the following for comparison with Class II PSD increments: nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and particulate matter with an aerodynamic diameter less than 10 microns (PM_{10}). Total impacts of NO_2, SO_2, and PM_{10} were compared to the AAQS. Modeled concentrations of nitrogen oxides (NO_x) were converted to NO_2 by multiplying them by the U.S. Environmental Protection Agency's (EPA) empirically derived scaling factor of 0.75. Incremental impacts of carbon monoxide (CO) were compared to significant impact levels (SIL). Maximum potential emissions of volatile organic compounds (VOC), which are precursors to ozone (O_3), were modeled to provide a worst-case estimate of O_3 impacts. Maximum potential impacts of lead were estimated for comparison to the AAQS. The modeled concentrations were estimated for each criteria pollutant and applicable averaging period.

SIL modeling was completed by calculating potential impacts from the proposed EEC emission sources and comparing the results with the PSD SIL's. For AAQS modeling, proposed EEC as well as nearby emission sources were considered. Information about nearby source PM_{10}, NO_2, and SO_2 impacts within the significant impact area was provided by NDEP-BAPC and the Utah Department of Environmental Quality (UDEQ). The highest cumulative modeled concentrations for NO_2, SO_2, and PM_{10} were added to the appropriate background concentrations and compared to the applicable AAQS. Background concentrations were obtained from on-site monitoring data collected from September 2006 through August 2007. The background values represent one full year of data collection at the EEC project site.

6.0 AMBIENT AIR QUALITY IMPACT

6.1 Class II Area Air Impact Analysis (cont.)

This method of evaluating cumulative impacts from the EEC and neighboring sources can overestimate concentrations because impacts from other modeled sources and background monitoring can double-count concentration impacts; however, this method ensures that ambient standards will not be exceeded. Modeled VOC concentrations were directly compared to the O_3 AAQS without taking into account chemical transformation in the atmosphere. Modeled CO concentrations were compared to the applicable modeling significance levels. Modeled lead concentrations were compared to the AAQS for lead. All receptors in the data set were evaluated for compliance with AAQS.

The PSD minor source baseline date for Hydrographic Basin 179, the air basin in which the EEC is located, is June 4, 1979, for PM_{10}, December 28, 2006, for NO_x, and December 28, 2006, for SO_2. Modeling completed to evaluate PSD increment consumption was accomplished by adding nearby source impacts to the EEC impacts. Because a baseline inventory has not yet been completed for the region in which EEC is located, all emission sources were conservatively assumed to be PSD increment consuming and were included in the PSD increment consumption analysis. Model results represent cumulative impacts from all emission sources in the basin. PSD increment consumption was evaluated by comparing the modeled pollutant concentrations with the pollutant PSD increment values. Table 2-1 summarizes the modeling significance levels, National AAQS, Nevada AAQS, and PSD increments that the EEC must meet to demonstrate compliance with AAQS.

TABLE 2-1

MODELING SIGNIFICANCE LEVELS AND AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Period	Modeling Significance Level[(a)] ($\mu g/m^3$)	National AAQS ($\mu g/m^3$)	Nevada AAQS ($\mu g/m^3$)	PSD Class II Increment ($\mu g/m^3$)
NO_2	Annual	1	100	100	25
SO_2	Annual	1	80	80	20
	24 hours	5	365[(b)]	365	91[(b)]
	3 hours	25	1,300[(b)]	1,300	512[(b)]
CO	8 hours	500	10,000[(b)]	10,000[(c)]	NA
	1 hour	2,000	40,000[(b)]	40,000	NA
PM_{10}	Annual	1	Revoked[(d)]	50	17
	24 hours	5	150[(b)]	150	30[(b)]
Lead	Quarterly	NA	1.5	1.5	NA
O_3	1 hour	NA	235[(b)]	235	NA

Notes:

$\mu g/m^3$ Microgram per cubic meter
NA Not applicable

a Source: EPA 1990
b Not to be exceeded more than once per calendar year
c 6,670 $\mu g/m^3$ at areas equal to or greater than 5,000 feet above mean sea level
d EPA revoked this standard effective December 17, 2006

6.0 AMBIENT AIR QUALITY IMPACT

6.1 Class II Area Air Impact Analysis (cont.)

The modeling analysis was conducted in accordance with the guidance and protocols outlined in the Nevada air pollution rules (NAC Chapter 445B) and EPA's "Guideline on Air Quality Models (Revised)" (EPA 2005). The following sections discuss model selection and setup, building downwash calculation, background concentrations, meteorological data, source input data, and model receptors, followed by a summary of modeling results.

6.1.1 Model Selection and Setup

The dispersion modeling was conducted using the American Meteorological Society/ EPA Regulatory Model Improvement Committee Dispersion Model named "AERMOD." Use of AERMOD is consistent with the NDEP-BAPC PSD increment tracking system. EPA recently recognized AERMOD as an approved model for use in regulatory applications (EPA 2005). The approved version of AERMOD (Version 07026) includes PRIME downwash algorithms and corrects several other minor problems associated with the previous version of AERMOD.

AERMOD is a Gaussian plume dispersion model based on planetary boundary layer principles for characterizing atmospheric stability. The model evaluates the non-Gaussian vertical behavior of plumes during convective conditions based on the probability density function and the superposition of several Gaussian plumes. The AERMOD modeling system has three components: (1) AERMAP, the terrain preprocessor program; (2) AERMET, the meteorological data preprocessor; and (3) AERMOD, which includes the dispersion modeling algorithms.

AERMOD was developed to handle simple and complex terrain issues using improved algorithms. As with the Complex Terrain Dispersion Model, AERMOD uses the dividing streamline concept to address plume interactions with elevated terrain.

AERMOD was used to predict maximum pollutant concentrations in ambient air from EEC emissions for comparison with modeled SIL's, the AAQS, and PSD increments. AERMOD was run using all regulatory default options, including use of stack-tip downwash, buoyancy-induced dispersion, calms processing routines, upper-bound downwash concentrations for super-squat buildings, default wind speed profile exponents, vertical potential temperature gradients, and no use of gradual plume rise. The local terrain was incorporated into the calculations.

6.1.2 Building Downwash Calculation

The modeling analysis included evaluation of building dimensions at the EEC to assess potential downwash effects on stack emissions from nearby structures. Direction-specific downwash parameters were calculated using facility plot-plan maps and EPA's Building Profile Input Program PRIME (BPIPPRM) software. This software has produced building dimension data that have been used with the PRIME building downwash algorithms incorporated into AERMOD.

6.0 AMBIENT AIR QUALITY IMPACT

6.1.3 Background Concentrations

Ambient background concentrations represent the contribution of pollutant sources not included in the modeling analysis, including naturally occurring sources. Background concentrations were obtained from on-site monitoring data collected from September 2006 through August 2007. The background values represent one full year of data collection at the EEC project. After one full year of data has been collected, the modeling results will be re-evaluated based on the updated background concentrations. Background concentrations of SO_2, NO_2, CO, O_3, and PM_{10} were obtained from on-site monitoring data collected from September 2006 through August 2007. These data were used in the modeling analysis. Table 2-2 summarizes these background concentrations.

TABLE 2-2

SEPTEMBER 2006 THROUGH AUGUST 2007 BACKGROUND DATA

Pollutant	Averaging Period	Annual Ambient Background Concentration ($\mu g/m^3$)
SO_2	3 hours	4.0
	24 hours	3.0
	Period	3.0
PM_{10}	24 hours	19.0
	Period	7.0
NO_2	Period	3.7
CO	1 hour	2415
	8 hours	2358
O_3	1 hour	167

6.1.4 Meteorological Data

Dispersion modeling was conducted using one full year of data collected from the on-site meteorological monitoring station. This operating permit application to construct is submitted with modeling based on the first valid year of on-site data.

Based on discussions with NDEP-BAPC, Sierra Pacific Power Company and Nevada Power Company have installed on-site meteorological monitoring equipment at two sites adjacent to the proposed EEC locations. At each site, a 50-meter-high meteorological tower was installed with meteorological measurements collected at 2, 10, and 50 meters. In addition, a SODAR monitoring system was installed and is collecting wind data at heights from 50 meters up to approximately 500 meters above ground level. Ambient air quality monitors were also installed, collecting NO_x, SO_2, PM_{10}, CO, lead and O_3 data. The on-site system has collected measurements for a full year. The on-site measurements summarized below have been processed into a model-ready format using AERMET software for the full year of data collection:

6.0 AMBIENT AIR QUALITY IMPACT

6.1.4 Meteorological Data (cont.)

Parameter	Data Collection Level(s)
Net radiation	2 meters
Temperature	2, 10, and 50 meters
Wind direction	10 to 500 meters
Wind speed	10 to 500 meters
Standard deviation of azimuth angle of wind direction	10, 50 meters
Standard deviation of vertical component of wind speed	10 to 500 meters

Data collected at the 2, 10, and 50 meter levels are from tower data. Data collected from 75 meters to 500 meter levels are from SODAR. Final modeling with a full year of onsite data has incorporated wind measurements to 500 meters. Wind rose plots of the wind data collected onsite at the 10 and 200 meter levels from September 1, 2006 through February 28, 2007 are presented in Figure 2-1.

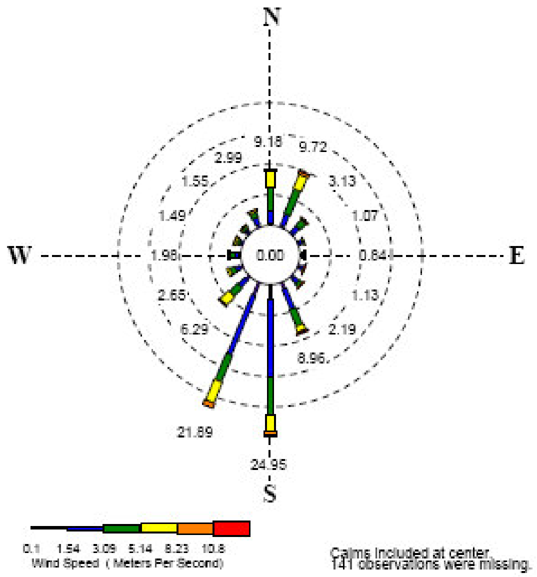
A summary of windroses from the on-site meteorological station shows that the predominant winds at the on-site station 10 meter level blow from the south 25.0% of the time, the south-southwest 21.9% of the time and from the north-northeast and north 18.9% of the time, while winds at the 200 meter level blow from the south 8.6% of the time, the south-southwest 28.6% of the time and from the north-northeast and north 21.3% of the time. Magnitudes of wind speeds at the 200 meter level are generally higher than those at the 10 meter level.

On-site meteorological data were processed with upper air and surface data from the Elko, NV and Ely, NV NWS stations, respectively. This is the most representative data available for the 2006 and 2007 monitoring period, as upper air data is no longer being collected at the Ely, NV NWS station.

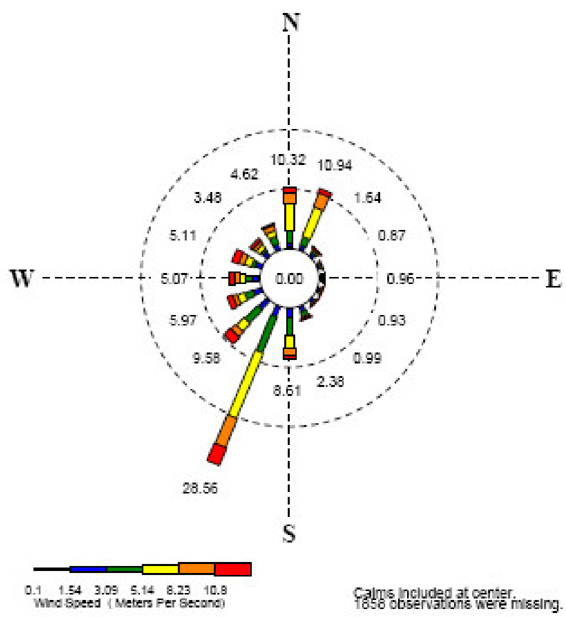
Surface parameters required as input to AERMET, but not included in the on-site dataset include albedo of ground cover, Bowen Ratio and surface roughness length. These parameters have been estimated using guidance in the User's Guide for the AERMOD Meteorological Preprocessor - AERMET (EPA 2004). The following variables were used for AERMET processing of both NWS and on-site data. These parameters represent desert shrub land and dry conditions.

Season	Albedo of Ground Cover	Bowen Ratio	Surface Roughness Length (m)
Winter	0.450	10.0	0.15
Spring	0.300	5.0	0.30
Summer	0.280	6.0	0.30
Fall	0.280	10.0	0.30

Figure 2-1
EEC On-Site Meteorological Data, 10-Meter Windrose
September 2006 - February 2007



200-Meter Windrose
September 2006 - August 2007



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6.1.5 Source Input Data

The EEC will emit significant amounts of criteria pollutants. Pollutant emissions for the combustion sources as well as material handling and fugitive emissions were quantified and incorporated into the modeling analysis. The modeled emission rates represent the maximum requested emission limits. A demonstration of compliance with these maximum emission rates would show compliance for all emission rate scenarios. Because of extensive model runtimes, all sources were modeled using short-term emission rates for PM_{10}, SO_2, VOCs and CO. For each of these pollutants, both short-term and annual concentrations were estimated in the same model run. Because NO2 does not have short-term ambient standards, annual average NOX emissions were used for modeling purposes. For NO_x sources that operate only a portion of the year, annual NOX emissions are calculated based on the proposed hours of operation for each source, and have been modeled over the entire modeling period.

Tables 2-3 and 2-4, of the environmental evaluation, summarize model parameters for the proposed EEC sources. Lead emissions are not represented on the tables because emission rates for lead are associated with the main stack only at a rate of 0.06 gram per second (g/s). This revision of the AIQA includes some changes to emission parameters, shown in Tables 2-3 and 2-4, of the environmental evaluation.

Preliminary modeling runs using the EPA SCREEN3 model were conducted to determine worst case emission conditions for the PC Boilers 1 and 2 stack. Stack conditions and estimated emission rates at 100, 75 and 50 percent load were input to the model. Results of the modeling indicate that maximum impacts would be associated with 100 percent load conditions; therefore, the full analysis is based on 100 percent load conditions.

Material handling emissions were quantified for worst-case modeling conditions and include wind erosion emissions from dormant and non-dormant piles.

The AERMOD User Guide (EPA 2004a) indicates that a line source can be represented in AERMOD using either a string of volume sources, or as an elongated area source. Volume source algorithms are most applicable to line sources with some initial plume depth, and area source algorithms are most applicable to near ground level line sources. Based on information provided in a 2003 Trinity paper “Analysis of Haul Road Emission Test Data for Determining Dispersion Modeling Parameters”, haul roads are justifiably represented by a line source with some initial plume depth.

6.0 AMBIENT AIR QUALITY IMPACT

6.1.5 Source Input Data (cont.)

Fugitive emissions from haul roads were modeled using the protocols developed by the Texas Commission on Environmental Quality (TCEQ). The TCEQ is one of the few state agencies that has provided written guidance on how to represent emissions from roadways in Gaussian models, and for determining the appropriate modeling parameters for haul road sources. A summary of the procedure recommended by TCEQ may be viewed in the environmental evaluation section of the application.

6.1.6 Model Receptors

The proposed EEC modeling was completed using a model receptor grid to ensure that maximum estimated impacts from the EEC are identified. In accordance with NDEP-BAPC and EPA guidelines, receptor locations were identified with sufficient density and spatial coverage to isolate the area with the highest impacts. To accomplish this, the following receptor groups were used for the analysis:

- Fence line at 25-meter intervals
- 100-meter receptor spacing out to 2 kilometers (km) in all directions from the center of the EEC
- 500-meter receptor spacing between 4 and 8 km from the EEC
- 1,000-meter receptor spacing between 8 and 50 km from the EEC
- 30 receptors located on surrounding mountain peaks to ensure maximum impacts are identified at these elevated locations

The total number of receptors is 12,816. Because of the large receptor domain, it is not practical to assign terrain elevations to all receptors using U.S. Geological Survey (USGS) 7.5-minute series digital elevation model (DEM) data; therefore, receptor elevations were assigned using USGS 1-degree DEM data. After initial modeling to determine the areas of highest impact, model receptor elevations were re-assigned for these high-impact areas using the higher resolution 7.5-minute DEM data.

6.1.7 EEC On-Site Meteorological Data

The dispersion modeling results discussed in this section are based on modeling conducted using the EEC on-site meteorological data collected from September 2006 through August 2007. The significant impact analysis showed that maximum CO concentrations are below modeling significance levels for the EEC sources; therefore, operation of the EEC sources will not significantly impact ambient CO concentrations. No further analysis of CO is necessary. Table 2-8 summarizes the modeled impacts from the proposed EEC sources and compares them with applicable SILs. Figures 2-4 through 2-6 show significant impact areas for NO_2, SO_2, and PM_{10}, respectively.

6.0 AMBIENT AIR QUALITY IMPACT

6.1.7 EEC On-Site Meteorological Data (cont.)

TABLE 2-8
EEC ON-SITE METEOROLOGICAL DATA
SIGNIFICANT IMPACT MODELING RESULTS

Pollutant	Averaging Period	Maximum Modeled Concentration ($\mu g/m^3$)[a]	SIL ($\mu g/m^3$)[a]	Location UTM-X (meters)	Location UTM-Y (meters)
NO_2	Annual	3.4	1	689400	4376951
PM_{10}	24 hours	25.5	5	689850	4376957
	Annual	8.9	1	689875	4376957
SO_2	3 hours	173	25	697364.6	4375600
	24 hours	17.5	5	697364.6	4375600
	Annual	0.89	1	698000	4394100
CO	1 hour	648	2,000	697364.6	4375600
	8 hours	161	500	690331	4373371

Note:
a The NO_X to NO_2 conversion factor of 0.75 was applied.

Modeled concentrations of NO_2, SO_2 and PM_{10} exceeded modeling significance levels; therefore, AAQS and PSD increment analyses were performed. An analysis of maximum radius of significant impact was conducted for each of these pollutants. Table 2-9 summarizes significant impact radii for NO_2, SO_2, and PM_{10}. As shown in Figures 2-4 and 2-6, significant impact areas associated with annually averaged NO_2 and PM_{10} concentrations did not extend beyond HA-179. Annual SO_2 concentrations did not exceed the significant impact level. Therefore, no neighboring hydrographic basins would be triggered by the proposed EEC project.

TABLE 2-9
SIGNIFICANT IMPACT RADIUS DETERMINATION

Pollutant	Significant Impact Radius (km)
NO_2	8.8
SO_2	43.8
PM_{10}	12.4

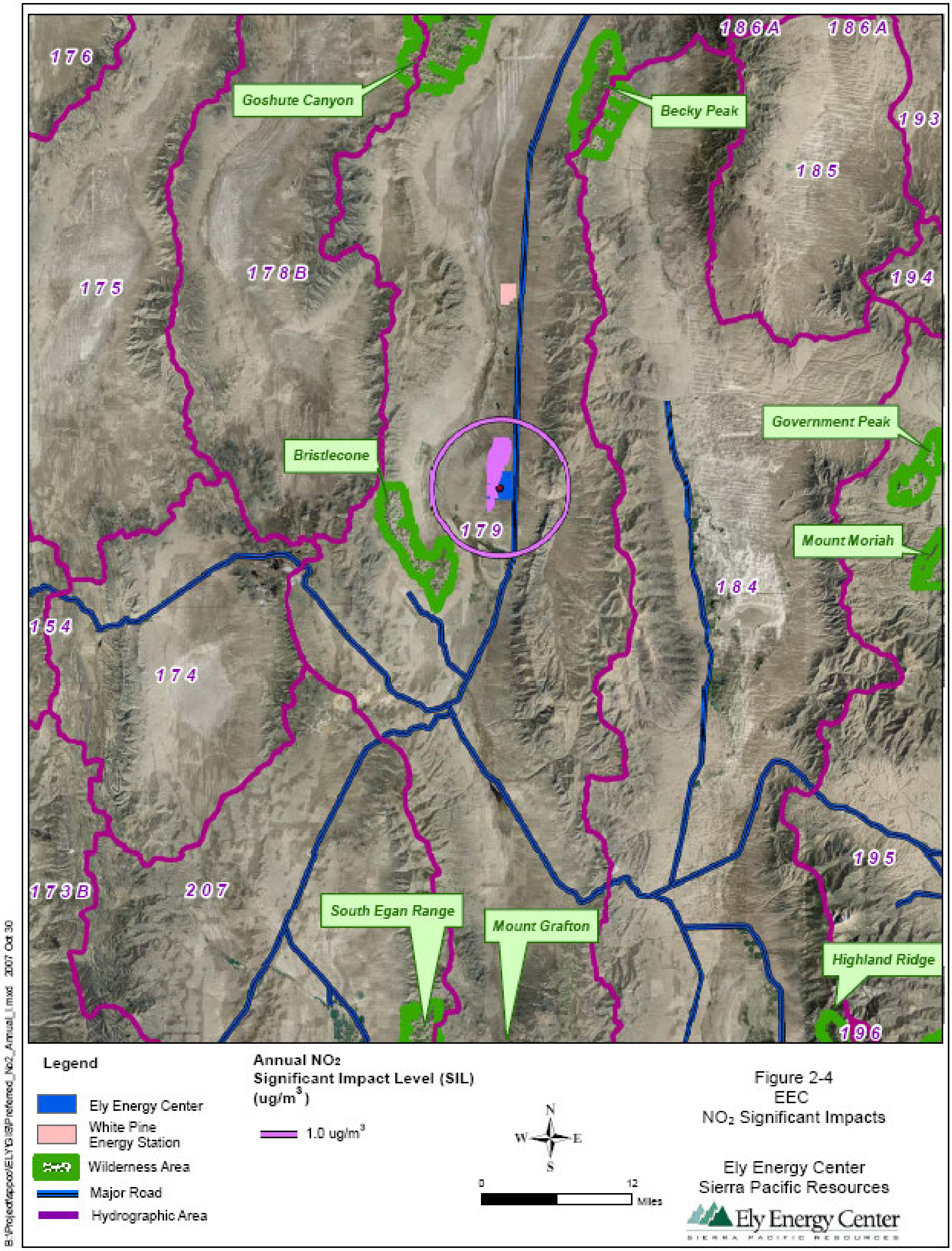


Figure 2-4
EEC
NO_2 Significant Impacts

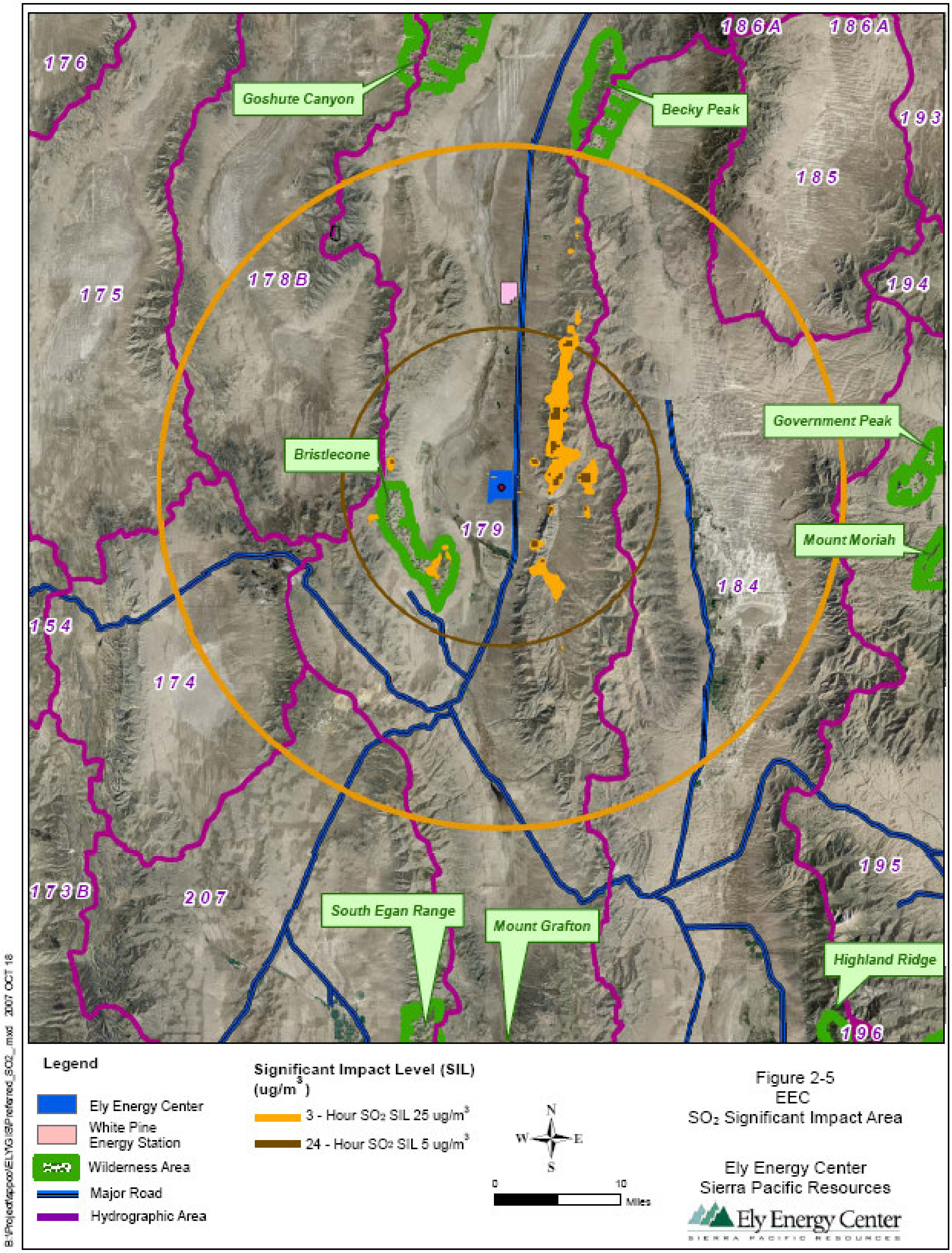
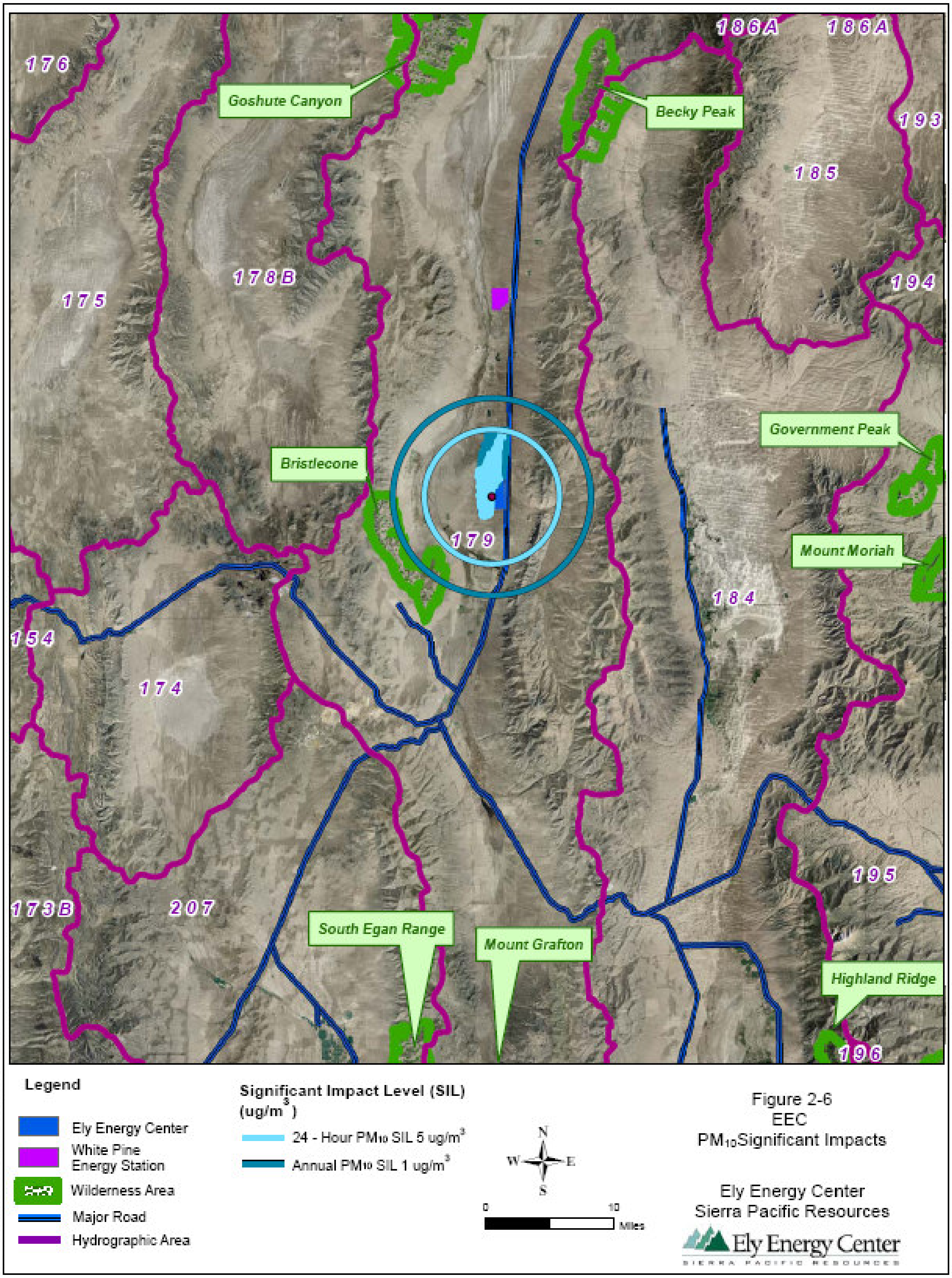


Figure 2-5
EEC
SO_2 Significant Impact Area


176
Goshute Canyon
186A
186A
Becky Peak
193
185
178B
175
194
Government Peak
Bristlecone
179
Mount Moriah
184
154
174
195
173B
207
South Egan Range
Mount Grafton
Highland Ridge
196
Legend
Ely Energy Center
White Pine Energy Station
Wilderness Area
Major Road
Hydrographic Area
Significant Impact Level (SIL) (ug/m^3)
24 - Hour PM_{10} SIL 5 ug/m^3
Annual PM_{10} SIL 1 ug/m^3
N
W
E
S
0
10
Miles
Figure 2-6
EEC
PM_{10} Significant Impacts
Ely Energy Center
Sierra Pacific Resources
Ely Energy Center
SIERRA PACIFIC RESOURCES

6.0 AMBIENT AIR QUALITY IMPACT

6.1.7 EEC On-Site Meteorological Data (cont.)

Cumulative modeling for SO_2, PM_{10}, and NO_2 was conducted to include all sources within 110 km of the proposed EEC site. Cumulative modeling for SO_2, PM_{10}, and NO2 demonstrates that the EEC project will comply with the PSD increments and AAQS levels. Table 2-10 summarizes the AAQS modeling results, and Table 2-11 summarizes the PSD increment modeling results. Modeled concentrations of VOCs and lead presented in Table 2-10 were compared with the AAQS to assess compliance with O3 and lead standards.

The highest cumulative annual NO_2 impact with the background value added is predicted to be 8.9 µg/m3. This value is below the AAQS value of 100 µg/m3. The highest cumulative 24-hour and annual PM_{10} impacts within the Significant Impact Area (SIA), with background values added are 50.9 and 16.5 µg/m3, respectively. These values are below the respective AAQS values of 150 and 50 µg/m3. The maximum modeled cumulative high-first-high PM_{10} 24-hour and annual concentrations were predicted to be 830 and 42 µg/m3, respectively. The locations of the receptors where these maximums were predicted are well outside of the EEC SIA, and contributions to concentrations at these receptors from EEC are less than significance levels. The highest cumulative 3-hour, 24-hour, and annual SO2 impacts with background values added are 180, 37.0, and 9.9 µg/m3, respectively. These values are below the respective AAQS values of 1,300, 365, and 80 µg/m3. Nearby source impacts were not available for VOC or lead emissions; therefore, impacts from EEC sources alone were compared to AAQS values. The highest 1-hour VOC impact with background values added is predicted to be 225 µg/m3. This value is below the AAQS value of 235 µg/m3 for O3. The highest monthly lead impact is predicted to be 0.0006 µg/m3. This value is below the AAQS value of 1.5 µg/m3 for quarterly lead concentrations.

TABLE 2-10
EEC ON-SITE METEOROLOGICAL DATA
NEVADA AAQS MODELING RESULTS

Pollutant	Averaging Period	Cumulative Highest Modeled Concentration ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Concentration ($\mu g/m^3$)	Nevada AAQS[a] ($\mu g/m^3$)
NO_2	Annual	5.2[b][c]	3.7	8.9	100
SO_2	3 hours	176[c]	4.0	180	1,300
	24 hours	34.0[c]	3.0	37.0	365
	Annual	6.9[c]	3.0	9.9	80
PM_{10}	24 hours	31.9[c][d]	19.0	50.9	150
	Annual	9.4[c][d]	7.0	16.5	50
Lead	Monthly	0.00059[e]	NA	0.00059	1.5
O_3	1 hour	57.7[e][f]	167	225	235

Notes:

a National and Nevada AAQS are identical in magnitude. Short-term national standards allow one exceedance per calendar year. Short term values are 1st-highest in accordance with NDEP policy.

b The NO_x to NO_2 conversion factor of 0.75 was applied.

c The receptor exhibiting maximum impact for this averaging period was directly adjacent to (and possibly within) the Nevada Slag site and did not exhibit a significant contribution from the EEC facility. It was therefore not included in the results.

d Cumulative modeling concentrations are within the Significant Impact Area (12,432 m from the main stack).

e From EEC sources only

f High-second-high concentration in accordance with National AAQS.

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6.1.7 EEC On-Site Meteorological Data (cont.)

TABLE 2-11
EEC ON-SITE METEOROLOGICAL DATA
PSD MODELING RESULTS

Pollutant	Averaging Period	Cumulative PSD Increment Consumption ($\mu g/m^3$)[(a)]	PSD Increment ($\mu g/m^3$)
NO_2	Annual	5.2[(b)(c)]	25
SO_2	3 hours	94.4[(c)]	512
	24 hours	27.4[(c)]	91
	Annual	6.9[(c)]	20
PM_{10}	24 hours	25.8[(c)(d)]	30
	Annual	9.4[(c)(d)]	17

Notes:
a Value represents the highest modeled impact within the significant impact area and outside the EEC fence line (second highest value for short-term averages)
b The NO_x to NO_2 conversion factor of 0.75 was applied.
c The receptor exhibiting maximum impact for this averaging period was directly adjacent to (and possibly within) the Nevada Slag site and did not exhibit a significant contribution from the EEC facility. It was therefore not included in the results.
d Cumulative modeling concentrations are within the Significant Impact Area (12,432 m from the main stack).

The modeled 3-hour SO_2 increment consumption is 94.4 μg/m3, which is below the PSD increment of 512 μg/m3. The modeled 24-hour SO_2 increment consumption is 27.4 μg/m3, which is below the PSD increment of 91 μg/m3. The annual SO_2 increment consumption is 6.9 μg/m3, which is below the PSD increment of 20 μg/m3. The modeled 24-hour PM10 increment consumption within the SIA is 25.8 μg/m3, which is below the PSD increment of 30 μg/m3. The annual PM_{10} increment consumption within the SIA is 9.4 μg/m3, which is below the PSD increment of 17 μg/m3. The maximum modeled cumulative high-second-high PM_{10} 24-hour and high-first-high annual concentrations were predicted to be 228 and 42 μg/m3, respectively. The locations of the receptors where these maximums were predicted are well outside of the EEC SIA, and contributions to concentrations at these receptors from EEC are less than significance levels. The annual NO_2 increment consumption is 5.2 μg/m3, which is below the PSD increment of 25 μg/m3. Figures 2-7 through 2-19, of the application, show applicable plots of AAQS and PSD impact contours for NO_2, PM_{10}, SO_2 and O_3.

Based on the modeling results presented, the EEC will comply with all applicable AAQS and PSD increment consumption limits. In addition, based on a review of annual SIL modeling and contour plots, significant impacts from EEC do not extend beyond HA 179 and into another hydrographic basin.

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6.2 Long-Range Air Impact Analysis

This section identifies the technical approach for the PSD long-range AQIA for the proposed EEC and also presents the modeled impacts. This modeling was completed to assess the potential air quality impact of the proposed EEC at two Class I areas and two Class II areas that are controlled by federal land managers (FLM). Class I areas are national parks and wilderness areas designated under the *Clean Air Act* and afforded special protection from adverse air quality impacts. Class II FLM areas are parks, wilderness areas, or other valued areas not under Class I protection.

The FLMs request a long-range dispersion modeling analysis for any Class I areas that lie between 50 and 300 km of a proposed source. The Class I areas within this range of the EEC include Jarbidge Wilderness Area (WA) located approximately 235 km north-northwest of the EEC in Nevada and Zion National Park (NP) located approximately 250 km southeast of the EEC in Utah. In addition, two Nevada Class II areas were evaluated using the long-range modeling methodology at the request of the National Park Service (NPS) and the U.S. Forest Service (USFS). Great Basin NP and Ruby Lake National Wildlife Refuge (NWR) were both evaluated for the long-range modeling analysis, and modeling results were compared with Class II criteria. Great Basin NP is located 63 km southeast of the EEC, and Ruby Lake NWR is located 86 km northwest of the EEC. Each of these areas is located further than 50 km and less than 300 km from the EEC. No FLM areas are closer than 50 km from the EEC. Figure 3-1 depicts the Class I and Class II FLM areas included in this analysis along with the proposed location of the EEC.

The dispersion modeling analysis must include a demonstration of compliance with PSD Class I increments and other AQRVs, including visibility impairment criteria and sulfate and nitrate deposition criteria. The PSD increment and AQRV analyses involve evaluation of the long range transport impacts of EEC emissions on the Class I areas. Three key evaluations are (1) PSD increment consumption for PM_{10}, SO_2, and NO_2, (2) visibility degradation (a haze analysis for long-range transport), and (3) impacts from deposition of acid-forming compounds on sensitive species in the study area.

The long-range impact analysis was completed to assess compliance with PSD Class I and Class II increments for PM_{10}, SO_2, and NO_2, and to assess deposition impacts and visibility impairment at the Class I areas. The Class II areas are not required to meet specific visibility and acid deposition protection levels. As such, the AQRV analyses were completed for the Great Basin NP and Ruby Lake NWR for informational purposes only. The dispersion modeling analysis was completed by following protocols established by EPA and the FLMs for long-range transport modeling and in accordance with the dispersion modeling protocol submitted to NPS and USFS.

The following sections discuss the dispersion model selection and setup, the modeling domain, building downwash calculation, meteorological data, receptors and topography, background air quality, modeled emissions sources, and a summary of modeling results.

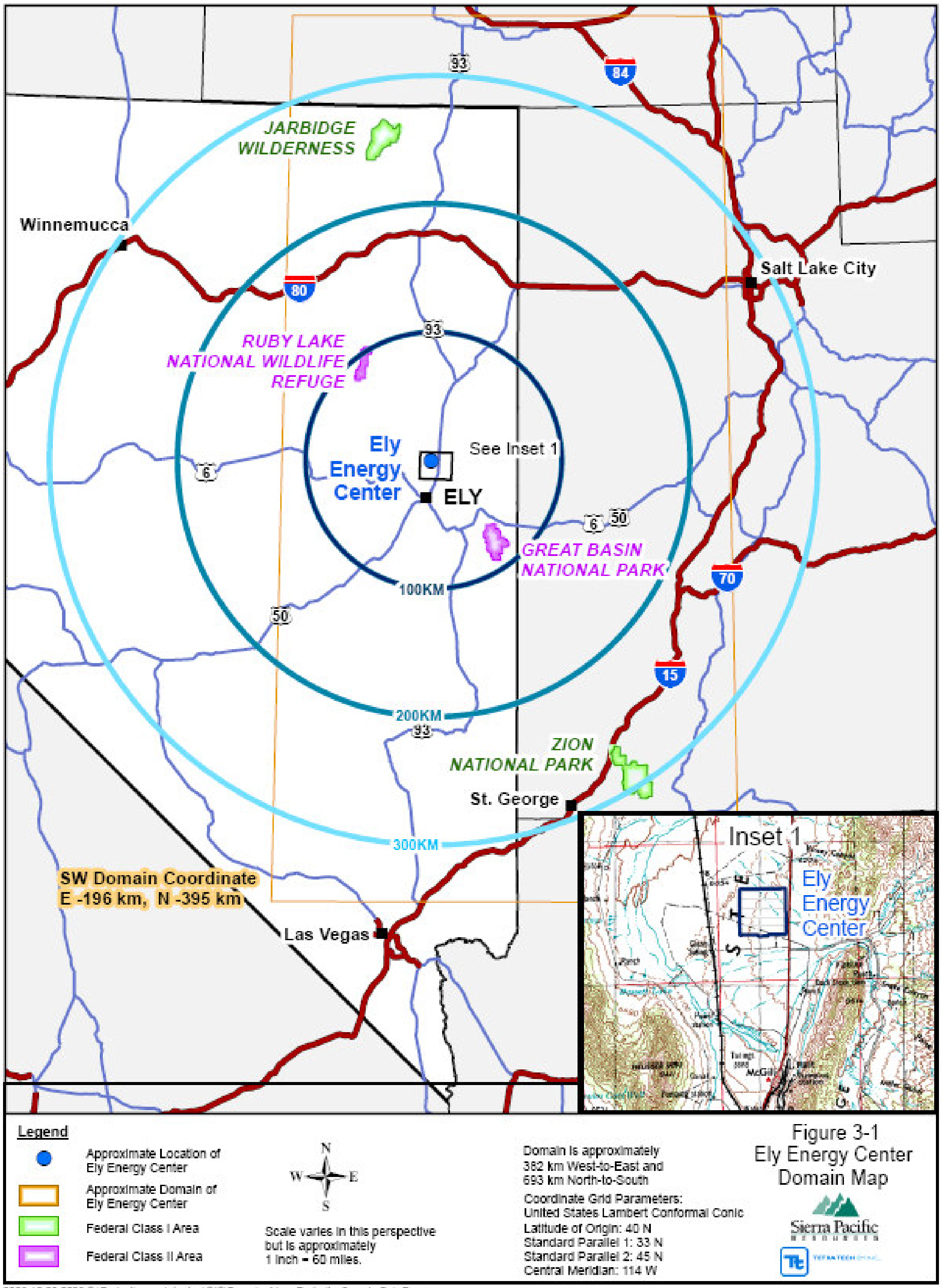


Figure 3-1
Ely Energy Center
Domain Map

2006-10-23 2006 S:\Project\sppco\steptoe\GIS\Domain_Map_Portrait_v2.mxd Bob Fames

6.0 AMBIENT AIR QUALITY IMPACT

6.2.1 Model Selection and Setup

The CALPUFF model was used for the long-range PSD increment analysis, acid deposition analysis, and visibility impairment evaluation. CALPUFF is recognized by EPA as an approved model for regulatory use in long-range transport modeling. CALPUFF is a non-steady-state puff dispersion model that can simulate pollutant transport and transformation over distances ranging from tens to hundreds of kilometers. CALPUFF can use three-dimensional meteorological wind field data or single-station meteorological data consistent with the ISCST3 model input. The regulatory version of the model consists of the following suite of programs:

• CALMET Version 5.53a
• CALPUFF Version 5.711a
• CALPOST Version 5.51
• CALSUM Version 1.2
• POSTUTIL Version 1.3

For the most part, the regulatory versions of the CALPUFF suite were used for this modeling analysis. However, because of numerous corrections and upgrades to the regulatory version of several CALPUFF post-processors, this study used more recent versions of some model software. The CALPUFF post-processor module versions used in this study that differ from the regulatory versions include the following:

• CALPOST Version 5.6393 Vistas (used for alternate visibility analysis only)
• CALSUM Version 1.33 Vistas
• POSTUTIL Version 1.43 Vistas

The post-processors CALPOST, CALSUM, and POSTUTIL are from the Vistas version of the CALPUFF suite and were used in this study because of their ability to present data as required for this analysis. CALPUFF was run in the refined mode using the regulatory default options and CALMET wind field meteorological input data. The modeling was completed using the MESOPUFF II chemical transformation scheme, and dry and wet deposition calculations. The modeling approach was generally based on recommendations in (1) EPA's "Interagency Workgroup on Air Quality Modeling (IWAQM) Phase II Summary Report and Recommendations for Modeling Long-Range Transport Impacts" (EPA 1998) and (2) the USFS, NPS, and U.S. Fish and Wildlife Service (USFWS) "Federal Land Managers' Air Quality Related Values Workgroup (FLAG) Phase I Report" (USFS, NPS, and USFWS 2000). Table 3-1 summarizes the model control file settings used in the CALPUFF model.

6.0 AMBIENT AIR QUALITY IMPACT

6.2.2 Modeling Domain

Figure 3-1 shows the modeling domain used in the CALPUFF analysis. The domain was developed to include the Jarbidge WA and Zion NP, and to allow a minimum 50-km buffer zone on all sides of the Class I areas. The buffer zone allows for re-circulation of puffs after they have passed a Class I area. The modeling domain is a 333- by 689-km area, and each grid cell has 3-km spacing. This spacing results in a domain area of 111 by 229 grid cells. The domain was developed using the Lambert Conformal Conic projection.

6.2.3 Building Downwash Calculation

The modeling analysis included evaluation of building dimensions at the EEC to assess potential downwash effects on stack emissions from nearby structures. The direction-specific building downwash parameters were calculated using facility plot-plan maps and BPIPPRM software, which is the building downwash program associated with the PRIME downwash algorithms. Output from the BPIPPRM software indicates that the main stack for the boilers is at a height that conforms with good engineering practices and that the buildings, therefore, will not impact the main stack's plume.

6.2.4 Meteorological Data

The CALPUFF modeling analysis was completed using 3 years of meteorological data collected from 2002 through 2004. The CALMET wind field data set consists of observations from 7 surface stations, 4 upper-air stations, and 51 precipitation stations within or near the CALPUFF modeling domain. The data set also includes concurrent data from the National Center for Atmospheric Research/Penn State Mesoscale Model (MM5) provided by Alpine Geophysics in a CALMET-ready format. These data were processed into yearly three-dimensional wind field data sets and used in the CALPUFF modeling analysis.

Several preprocessing steps are necessary to develop input data for CALMET. The preprocessing steps used to develop CALMET input data are summarized below.

- **Terrain Data**: USGS 1-degree DEM data covering the modeling domain were processed using the TERREL terrain preprocessor program. Figure 3-2 displays the processed terrain contours used in CALMET.
- **Land Use Data**: Composite Theme Grid (CTG) land-use and land-cover data were obtained for the modeling domain area. Using the data processors CTGCOMP and CTGPROC, these data were processed into a format readable by CALMET. Both the terrain and the land-use data were processed together into one file using MAKEGEO. Figure 3-3 shows the land use inputs to CALMET.
- **Surface Meteorological Data**: NWS surface data from seven stations were used for meteorological years 2002 through 2004. These data were obtained from the National Climatic Data Center (NCDC) in an Hourly Datsav3 format (NCDC 2006). Missing data were obtained in accordance with EPA guidance (EPA 2005). Data were converted to CD144 format and processed using the SMERGE software. Figure 3-4 shows the locations of the surface stations used in CALMET.

TABLE 3-1
CALPUFF MODEL CONTROL FILE SETTINGS

Model Parameter/Option	Value/Selection
Number of chemical species (NSPEC)	10
Number of chemical species emitted (NSE)	8
Vertical distribution near field (MGAUSS)	Gaussian
Terrain adjustment method (MCTADJ)	Partial plume path adjustment
Subgrid-scale complex terrain (MCTSG)	Not modeled
Slug model (MSLUG)	Not used
Transitional plume rise (MTRANS)	Yes
Stack tip downwash (MTIP)	Yes
Vertical wind shear (MSHEAR)	No
Puff splitting (MSPLIT)	Yes
Chemical mechanism (MCHEM)	MESOPUFF II scheme
Wet removal (MWET)	Yes
Dry deposition (MDRY)	Yes
Dispersion coefficient method (MDISP)	PG Dispersion Coefficients
PG sigma-y,z adj. for roughness (MROUGH)	No
Partial plume penetration (MPARTL)	Yes
PDF used under convective conditions (MPDF)	No
CSPEC	SO_2, SO_4, NO_x, HNO_3, nitrate, PM_{10}, fine particulate matter (PMF),secondary organic aerosols (SOA), elemental carbon (EC), and coarse particulate matter (PMC)
Chemical parameters – dry gas deposition	Default
Size parameters – dry particle deposition	PMC: 6.25 micrometers (µm); PMF: 0.48 µm
Reference cuticle resistance (RCUTR)	30 seconds per centimeter (s/cm)
Reference ground resistance (RGR)	10 s/cm
Reference pollutant reactivity (REACTR)	8
Number of particle-size intervals (NINT)	9
Vegetation state in un-irrigated areas (IVEG)	1
Wet deposition parameters	Default
O_3 data input option	1 (use hourly O_3 concentrations)
Backup default O_3 concentration	60 parts per billion (ppb)
Monthly background ammonia concentration	0.2, 0.2, 0.2, 0.5, 0.5, 1.0, 1.0, 1.0, 1.0, 0.5, 0.5, 0.2 ppb
SYTDEP	550 meters
MHFTSZ	0
JSUP	5
XSAMLEN	1.0 grid units
CONK1	0.01
CONK2	0.1
MXNEW	99
MXSAM	99
Maximum mixing height	4,000 meters
Minimum mixing height	50 meters
NSPLIT	2
IRESPLIT	Hours 17-22 = 1
ZISPLIT	100 meters
ROLDMAX	0.25
NSPLITH	5
SYSPLITH	1.0
SHSPLITH	2.0

6.0 AMBIENT AIR QUALITY IMPACT

6.2.4 Meteorological Data (cont.)

- **Upper Air Meteorological Data**: NWS upper-air data from four stations were used in the modeling analysis. The data were in a TD-6201 format and were pre-processed for modeling using the READ62 upper air preprocessor program. Missing soundings in the data set were filled in by substituting sounding data from a nearby station for the same period. Figure 3-4 shows the locations of the weather stations used in CALMET.
- **Precipitation Data**: NWS precipitation data from 49 to 51 stations (depending on the year) were used in CALMET. The precipitation data were obtained from the NCDC and processed into model-ready format using the PMERGE software. Figure 3-4 shows the locations of the weather stations used in CALMET.
- **MM5 Data**: CALMET can use prognostic wind field data along with observations when wind fields are developed to enhance the data set. The MM5 data acquired from Alpine Geophysics were already in a CALMET-ready format and were used in the CALMET processing as initial guess fields. The MM5 grid resolution is 36 km.

FIGURE 3-2
CALPUFF Domain Terrain

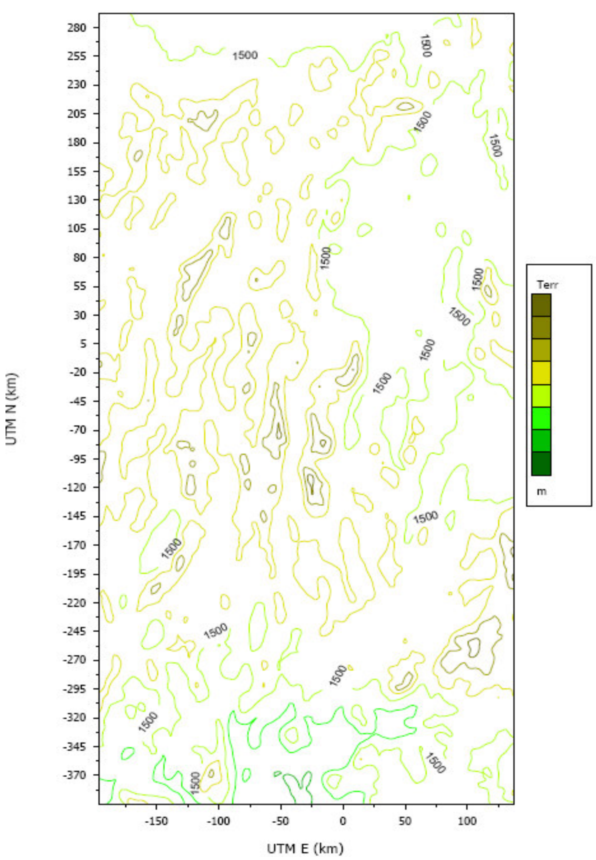
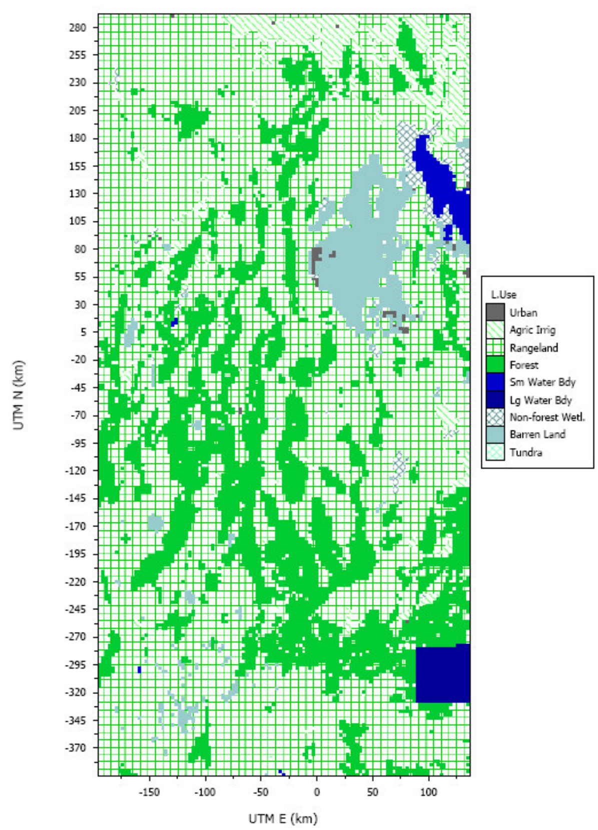


FIGURE 3-3
CALPUFF Domain Land Use



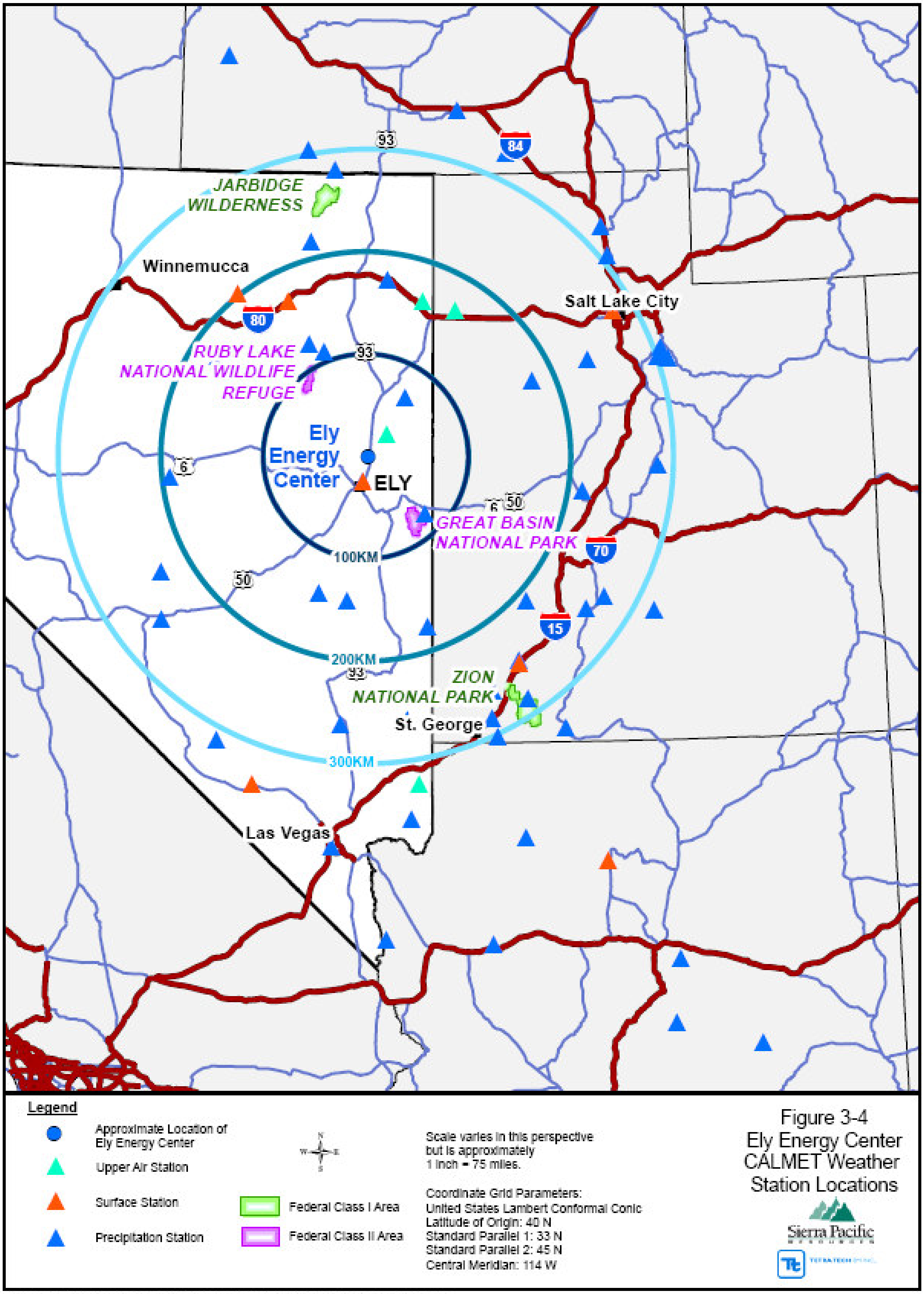


Figure 3-4
Ely Energy Center
CALMET Weather
Station Locations

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6.0 AMBIENT AIR QUALITY IMPACT

6.2.4 Meteorological Data (cont.)

As previously stated, the CALMET domain area consists of a 111 by 229 cell grid with 3-km grid spacing. The grid includes 12 vertical layers with heights set at 20, 40, 80, 120, 180, 260, 400, 600, 800, 1,200, 2,000, and 4,000 meters above ground level. Table 3-2 summarizes the CALMET control file settings used to process the meteorological data.

6.2.5 Receptors and Topography

There are 398 total receptors spread out over the two Class I areas included in the modeling analysis. There are 174 receptors located in the Jarbidge WA and 224 receptors in the Zion NP. These receptor data were developed by NPS and extracted from a database provided by NPS. The receptors have a spacing of roughly 1 km and cover the entire area of each Class I area.

NPS has not developed receptor data for Class II FLM areas at this time. Model receptor grids for these areas were developed using a similar methodology as that used by NPS for Class I areas. There are 312 receptors in the Great Basin NP and 160 receptors in the Ruby Lake NWR. Terrain elevations for these receptors were identified using USGS DEM data. Figure 3-5 shows the receptors used for the long-range modeling.

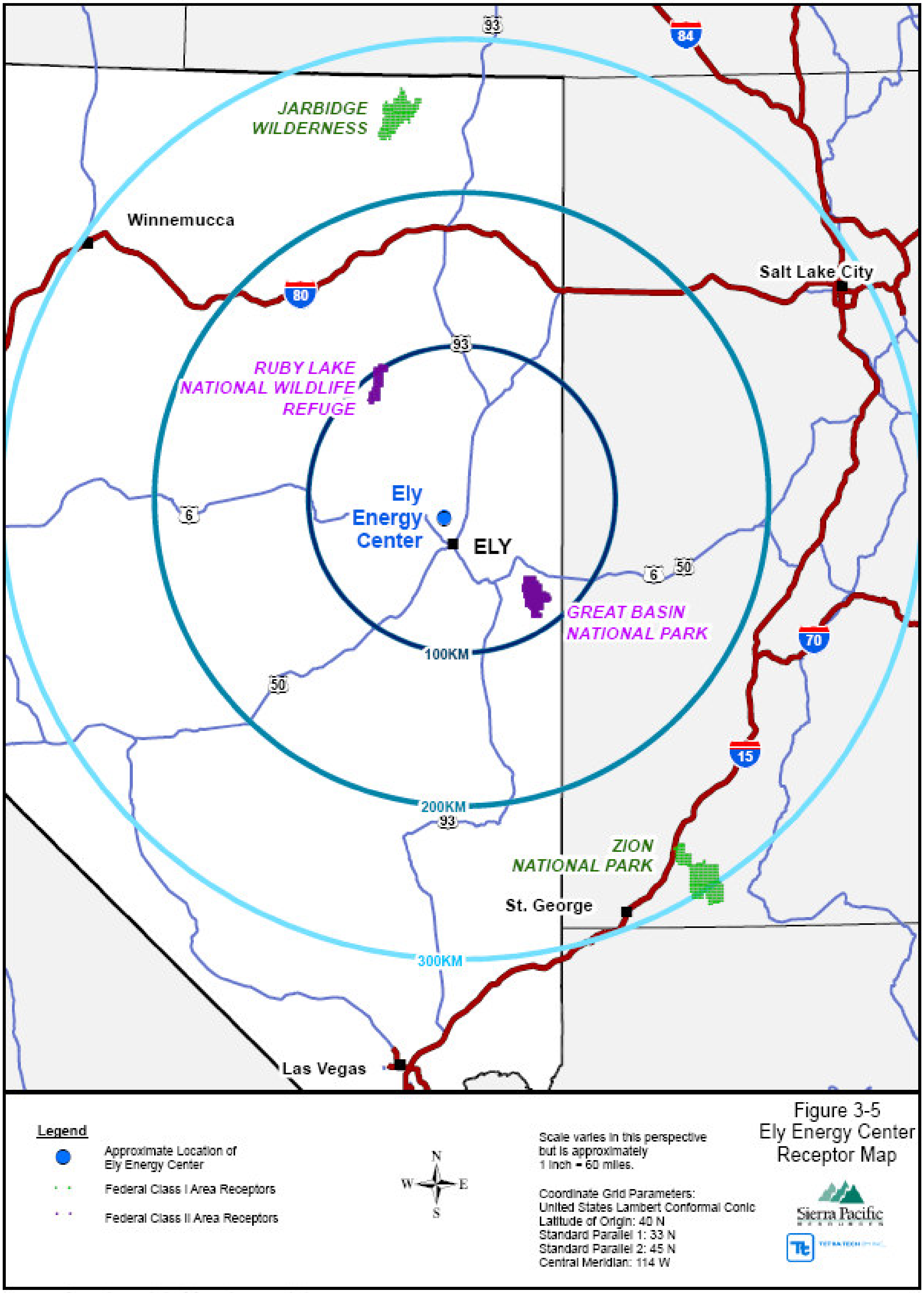
6.2.6 Background Air Quality

Background values for O3 and ammonia are required as inputs to CALPUFF. Hourly O3 data were obtained from the EPA Technology Transfer Network, Air Quality System (EPA 2006). Five O3 stations were included in the data set. The O3 station located nearest to the EEC was the Great Basin NP monitoring station.

Background ammonia concentrations in the areas around Ely and the Class I areas are expected to be low. The NPS has recommended a uniform background ammonia value of 1.0 part per billion (ppb) for the modeling analysis. This is the default value for arid lands cited in the IWAQM Phase II document (EPA 1998). A 1.0 ppb ammonia concentration may be a reasonable estimate for summer months, but is likely an over-prediction of concentrations for the remainder of the year.

TABLE 3-2
CALMET MODEL CONTROL FILE SETTINGS

Model Parameter/Option	Value/Selection
Number of upper air stations (NUSTA)	4
Number of east-west grid cells (Nx)	111
Number of north-south grid cells (Ny)	229
Grid spacing (DGRIDKM)	3 km
Southwest grid cell X coordinate (XORIGKM)	-196 km
Southwest grid cell Y coordinate (YORIGKM)	-395 km
Latitude of projection origin (RLAT0)	40.0N
Longitude of projection origin (RLON0)	114.0W
Matching parallels of latitude (XLAT1, XLAT2)	33.0N, 45.0N
UTM Zone (IUTMZN)	11
Number of vertical layers (Nz)	12
Vertical cell face heights (ZFACE)	0, 20, 40, 80, 120, 180, 260, 400, 600, 800, 1200, 2000, 4000
Number of surface stations (NSSTA)	7
Number of precipitation stations (NPSTA)	51
Gridded cloud data (ICLOUD)	0
Wind field model option (IWFCOD)	1 (diagnostic wind module)
Compute Froude no. adjustment effects (IFRADJ)	1
Adjust winds using kinematic effects (IKINE)	0
O'Brien procedure for vertical winds (IOBR)	0
Compute slope flows (ISLOPE)	1
Extrapolate surface winds to upper layers (IEXTRP)	-4
Extrapolate surface winds if calm (ICALM)	0
Surface/upper-air weighting factors (BIAS)	12*0
Prognostic wind field model (IPROG)	14
Use varying radius of influence (LVARY)	F
Max sfc radius of influence over land (RMAX1)	100 km
Max u/a radius of influence over land (RMAX2)	300 km
Max radius of influence over water (RMAX3)	200 km
Minimum radius of influence (RMIN)	0.1 km
Upper air extrapolation (RMIN2)	-1.0
Radius of influence of terrain feature (TERRAD)	10 km
Relative weight at sfc of step 1 field and obs (R1)	20 km
Relative weight aloft of step 1 field and obs (R2)	100 km
Maximum acceptable divergence (DIVLIM)	5.0E-6
Maximum no. of iterations in div min (NITER)	50
Number of passes in smoothing (NSMTH)	2, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4
Max no. of stations for interpolation (NINTR2)	12*99
Critical Froude number (CRITFN)	1
Empirical factor for kinematic effects (ALPHA)	0.1
Compute temperatures from obs. (IDIOPT1)	0
Surface station to use for surface temp (ISURFT)	2
Domain-avg. temperature lapse rate (IDIOPT2)	0
Station for lapse rates (IUPT)	3
Depth of domain-avg lapse rate (ZUPT)	200 meters
Compute internally initial guess winds (IDIOPT3)	0
Upper air station for domain winds (IUPWND)	-1
Bottom & top of layer for 1st guess winds (ZUPWND)	1, 2000 meters
Read surface winds from surf.dat (IDIOPT4)	0
Read aloft winds from UPn.dat (IDIOPT5)	0
Neutral mixing height B constant (CONSTB)	1.41
Convective mixing height E constant (CONSTE)	0.15
Stable mixing height N constant (CONSTN)	2400
Over-water mixing height W constant (CONSTW)	0.16
Absolute value of Coriolis parameter (FCORIOL)	1.0E-4
Spatial averaging of mixing heights (IAVEZI)	1
Max averaging radius (MNMDAV)	5
Half-angle for looking upwind (HAFANG)	30 degrees
Layer to use in upwind averaging (ILEVZI)	1
Minimum capping potential temp lapse rate (DPTMIN)	0.001
Depth for computing capping lapse rate (DZZI)	200
Minimum over-land mixing height (ZIMIN)	50
Maximum over-land mixing height (ZIMAX)	4000
Minimum over-water mixing height (ZIMINW)	50
Maximum over-water mixing height (ZIMAXW)	4000
3D temp from observations or prog data (ITPROG)	0
Interpolation type (IRAD)	1
Radius of temperature interpolation (TRADKM)	500
Max no. of stations in temp interpolation (NUMTS)	5
Conduct spatial averaging of temp (IAVET)	1
Default over-water mixed layer lapse rate (TGDEFB)	-0.0098
Default over-water capping lapse rate (TGDEFA)	-0.0045
Beginning land use type defining water (JWAT1)	999
Ending land use type defining water (JWAT2)	999
Method for precipitation interpolation (NFLAGP)	2
Precipitation radius for interpolations (SIGMAP)	100
Minimum cut off precip rate (CUTP)	0.01



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6.0 AMBIENT AIR QUALITY IMPACT

6.2.6 Background Air Quality (cont.)

A recent dispersion modeling analysis conducted for the proposed Desert Rock Generating Station in northwestern New Mexico incorporated monthly varying background ammonia concentrations into the modeling analysis. As described in the Desert Rock *Addendum to Modeling Protocol* (ENSR 2006), recent studies indicate that nitrate formation is over-predicted by a factor of 3 in CALPUFF when the default 1.0 ppb ammonia value is used in western arid climates. Instead, monthly varying ammonia concentrations were proposed and accepted by the NPS for the Desert Rock modeling. Because the EEC is also located in the rural western U.S. and subject to cold wintertime months, the same background ammonia concentrations used for Desert Rock were also used in this modeling. These values are:

January – March	0.2 ppb
April – May	0.5 ppb
June – September	1.0 ppb
October – November	0.5 ppb
December	0.2 ppb

Source: ENSR, 2006

6.2.7 Modeled Emissions Sources

The requested pollutant emission limits for the boilers described in Section 2.0 of this report were used in the CALPUFF modeling analysis. Pollutant emissions from the boilers will exit from a main stack from two separate flues. The maximum emissions from both boilers will be 1,742 lb/hr for CO, 1045 lb/hr for NOx, 348 lb/hr for PM10, 1394 lb/hr for 3-hour SO2, 1045 lb/hr for 24-hour SO2, and 61 lb/hr for VOCs. Because the auxiliary equipment will not typically operate simultaneously with the boilers, the boiler stack is the only emission source at the EEC that may impact the Class I areas.

To ensure that maximum potential short-term impacts were calculated, the maximum short-term emissions of NO_x, SO_2, and PM_{10} (including condensable particulates) were used in the modeling. The maximum 24-hour emissions were used to calculate all impacts except for 3-hour SO_2 impacts. Because maximum potential 3-hour SO_2 emissions are higher than maximum 24-hour SO_2 emissions, separate CALPUFF model runs were completed to assess the maximum potential 3-hour SO_2 impacts at the FLM areas. The same boiler stack parameters described in Section 2.0 were used for the long-range impact analysis. The UTM source coordinates were converted to Lambert Conformal System coordinates using Geographic Information System techniques.

6.0 AMBIENT AIR QUALITY IMPACT

6.2.8 Summary of Modeling Results

Potential emissions of SO_2, NO_2, and PM_{10} from the proposed EEC were modeled to determine whether they could significantly impact Class I or Class II FLM areas. If modeling results showed that the potential impacts were below the significance criteria for a given PSD pollutant, then a cumulative impact analysis was not performed. If any significant impact levels (SIL) were exceeded, then a cumulative impact analysis was completed and the results were compared to the PSD increments. The modeling analysis consisted of significant impact modeling for SO_2, NO_2, and PM_{10}, and Class I cumulative SO_2 PSD increment modeling as discussed below.

6.2.8.1 Significant Impact Modeling

Modeled significant impact results for the Class I and Class II areas were compared to EPA's proposed Class I and Class significant impact threshold values, respectively. Table 3-3 summarizes the Class I and Class II SILs recommended by EPA. Modeled concentration results were extracted from CALPUFF output files using the CALPOST post-processor.

TABLE 3-3

EPA CLASS I AND CLASS II SILS

Pollutant	Averaging Period	Class II PSD SIL ($\mu g/m^3$)	Class I PSD SIL ($\mu g/m^3$)
NO_2	Annual	1	0.1
SO_2	Annual	1	0.1
	24 hours	5	0.2
	3 hours	25	1.0
PM_{10}	Annual	1	0.2
	24 hours	5	0.3

Table 3-4 summarizes the significant impact modeling results for each PSD pollutant and averaging period. The results in Table 3-4 show that for Class I area significant impact modeling, maximum potential NO_2 and PM10 impacts are below the associated significant impact levels at all modeled Class I areas. The highest modeled annual NO_2 impact was 0.002 µg/m3 at the Jarbidge WA, which is below the SIL of 0.1 µg/m3. The highest 24-hour and annual Class I PM10 impacts are also associated with the Jarbidge WA and had values of 0.18 and 0.006 µg/m3, respectively. These concentrations are below the PM10 SILs of 0.3 µg/m3 (24-hour) and 0.2 µg/m3 (annual).

The results of the significant impact modeling for SO2 indicate that estimated maximum SO2 emissions will exceed the SILs at both the Jarbidge WA and Zion NP (see Table 3-4). Because the modeled concentrations exceed the SO_2 significance criteria, a cumulative SO_2 modeling analysis was conducted. Section 3.8.2 describes the details of this analysis.

6.0 AMBIENT AIR QUALITY IMPACT

6.2.8.1 Significant Impact Modeling (cont.)

The PSD increment modeling for the Great Basin NP and Ruby Lake NWR shows that all modeled concentrations are below the PSD Class II SILs (see Table 3-4); therefore, the EEC will not have a significant impact on PSD increment consumption in these areas. A cumulative PSD increment analysis is not necessary for the Great Basin NP or Ruby Lake NWR.

6.2.8.2 Class I Cumulative SO_2 PSD Increment Modeling

A cumulative SO_2 impact analysis was conducted for the Jarbidge WA and Zion NP, and results were compared to PSD Class I SO_2 increments. The cumulative SO_2 emission inventory was developed using the steps summarized below.

1. Identify minor source baseline dates for the Class I areas. The minor source baseline date for the area that includes the Zion NP is April 1, 1990, according to Utah Division of Air Quality (UDAQ). The minor source baseline date for the Jarbidge WA has not been triggered.

2. Obtain emissions data for increment-consuming sources. Because the baseline date has not been triggered for areas that include the Jarbidge WA, only changes in emissions to major sources from the SO_2 major source baseline date (January 6, 1975) consume increments in the Jarbidge WA. Emission source data were obtained from NDEP and UDAQ. In addition, two other agencies were contacted for data, including the Arizona Department of Environmental Quality and Idaho Department of Environmental Quality.

3. Eliminate all sources located farther than 300 km from each Class I area.

4. Screen remaining sources based on their total SO_2 emissions and distance from the Class I areas. In accordance with draft NPS guidance, a source can be eliminated from the inventory if its SO_2 emissions (in tons per year) are less than 0.8 times the distance to the Class I area (in km). All sources located more than 50 km from the opposite side of each Class I area (relative to the EEC) were also eliminated in accordance with NPS guidance.

5. Include remaining sources in the inventory. It should be noted that two sources retained in the inventory were located slightly off the CALPUFF modeling grid. To account for this fact, these sources were artificially relocated closer to the Class I areas so that they were within the CALPUFF modeling grid. The Goldstrike Mine in Nevada was slightly west of the modeling grid and was moved 2 km east to be within the grid. The Nevco Sigurd Power Plant in Utah was moved 52 km west to be located within the modeling grid. These actions were expected to have an insignificant effect on modeling results.

6.0 AMBIENT AIR QUALITY IMPACT

6.2.8.2 Class I Cumulative SO_2 PSD Increment Modeling (cont.)

Because the cumulative SO_2 increment modeling was expected to result in low overall impacts, no effort was made to include increment-expanding sources in the modeling. Inclusion of increment-expanding sources would act to reduce overall SO_2 impacts in the PSD increment analysis. Regional sources were modeled separately from the EEC, and impacts were combined using CALSUM post-processing software. Although not yet permitted or constructed, emissions from the proposed White Pine Energy Station were also included in the cumulative SO_2 modeling analysis. Table 3-5 summarizes the SO_2 emission sources used in the cumulative modeling.

The results of the cumulative SO_2 modeling show that all modeled concentrations are below the applicable SO_2 increment levels. Table 3-6 shows the highest modeled cumulative SO_2 PSD increment impacts. All impacts are below the applicable PSD Class I increment standards. The highest cumulative 3-hour, 24-hour, and annual SO_2 impacts were 2.51, 0.78, and 0.05 µg/m3, respectively.

TABLE 3-4

LONG-RANGE PSD SIGNIFICANT IMPACT MODELING RESULTS

Pollutant	Averaging Period	Modeled Concentration for Meteorological Year (µg/m^3)			PSD SIL
		2002	2003	2004	
Jarbidge WA (Class I)					
NO_2	Annual	0.0005	0.002	0.002	0.1
SO_2	3 hours	1.01	2.02	1.12	1.0
	24 hours	0.30	0.41	0.33	0.2
	Annual	0.01	0.01	0.01	0.1
PM_{10}	24 hours	0.17	0.18	0.15	0.3
	Annual	0.004	0.005	0.006	0.2
Zion NP (Class I)					
NO_2	Annual	0.001	0.001	0.001	0.1
SO_2	3 hours	0.58	0.95	1.04	1.0
	24 hours	0.19	0.12	0.23	0.2
	Annual	0.01	0.01	0.01	0.1
PM_{10}	24 hours	0.12	0.05	0.10	0.3
	Annual	0.004	0.003	0.003	0.2
Great Basin NP (Class II)					
NO_2	Annual	0.12	0.11	0.10	1
SO_2	3 hours	8.93	9.14	10.21	25
	24 hours	2.98	1.81	2.81	5
	Annual	0.17	0.15	0.14	1
PM_{10}	24 hours	1.05	0.67	1.08	5
	Annual	0.07	0.06	0.06	1
Ruby Lake NWR (Class II)					
NO_2	Annual	0.002	0.005	0.008	1
SO_2	3 hours	2.53	2.03	2.92	25
	24 hours	0.83	0.61	1.02	5
	Annual	0.02	0.02	0.03	1
PM_{10}	24 hours	0.56	0.36	0.43	5
	Annual	0.011	0.010	0.014	1

TABLE 3-5

REGIONAL SO2 EMISSIONS SOURCE INVENTORY

Facility	Location	Emission Unit	SO_2 Emissions (pounds/hour)
Graymont Western U.S.	Near Wendover, UT	Kiln 1	14.0
		Kiln 2	21.0
		Kiln 3	33.6
Newmont Mining, Gold Quarry	Near Battle Mountain, NV	Mill 6	27.4
		Preheaters	12.9
		Roasters	39.5
Barrick, Goldstrike Mine	Near Battle Mountain, NV	Mill 1	4.3
		Mill 2	4.3
		Roasting	44.9
		Agg. Dryer	10.6
Nevada Power, Reid Gardner	Northeast of Las Vegas, NV	Boiler #4	857.2
Chemical Lime, Apex Plant	Northeast of Las Vegas, NV	Kiln #4	127.7
Intermountain Power Plant	Near Delta, UT	Unit 3	905.0
Nevco Sigurd Power Plant	Sigurd, UT	S1	124.9
White Pine Energy Station (Proposed)	North of McGill, NV	Units 1 & 2	924.0
		Unit 3	462.0

TABLE 3-6

CUMULATIVE SO2 CLASS I PSD INCREMENT IMPACT RESULTS

Pollutant	Averaging Period	Modeled Concentration for Meteorological Year ($\mu g/m^3$)			PSD Increment
		2002	2003	2004	
Jarbidge WA (Class I)					
SO_2	3 hours	1.91	2.51	2.39	25
	24 hours	0.68	0.59	0.78	5
	Annual	0.03	0.04	0.05	2
Zion NP (Class I)					
SO_2	3 hours	1.84	1.26	1.46	25
	24 hours	0.53	0.35	0.49	5
	Annual	0.04	0.04	0.04	2

8.0 CONCLUSIONS / RECOMMENDATIONS

Based on the above review of the Operating Permit to Construct application and Best Available Control Technology analysis, SPRC request for a Class I Operating Permit to Construct for the EEC facility does not violate any applicable requirements. The Operating Permit to Construct Application was deemed complete, pursuant to NAC 445B.3364(2), when the preliminary determination to issue the Class I Operating Permit to Construct was made on October 29, 2007 (Attachment 1). As a result, I recommend that the conditions specified in the Draft Operating Permit to Construct be submitted to the public for review, in accordance with NAC 445B.3364(5).

Attachment (1) Preliminary Determination to Issue the Draft Permit / Application Completeness Letter
Attachment (2) Emission Calculations
Attachment (3) Draft Operating Permit to Construct

____________________________ _________________

Francisco Vega — Date
Staff Engineer, Permitting Branch

____________________________ _________________

Matthew A. DeBurle — Date
Supervisor, Permitting Branch